

1971 COOK INLET ANNUAL REPORT

SOUTHERN, OUTER & KAMISHAK DISTRICTS

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Southern District:

The total salmon catch for the Southern District in 1971 was 74,518 and accounted for 4.4 percent of the total Cook Inlet catch. This catch was the lowest on record since 1954. (Table 1)

Pink salmon have always been the major species in the Southern District, making up an average 81 percent of the catch since 1954. The 1971 pink catch of 50,066 was the lowest on record and accounted for only 67 percent of the catch. Red salmon have contributed an average of 7 percent of the Southern District catch since 1954. In 1971 a slightly better than average red catch of 18,403 made up 25 percent of the total catch. The coho catch of 3,151 was just below average, the chum catch of 2,857 was the third lowest on record, and the king catch of 41 was the fourth lowest on record. The 1971 salmon catch and percent by species by district appears in table 4 and the catch by week in table 5 . The pink salmon catches since 1954, depicting the even-odd year fluctuation, are shown in figure 1.

At this point it should be noted that a new system of management went into effect for the first time in 1971 and this undoubtedly contributed toward the lower than average catch.

Instead of a set date opening for seine gear in early June, which has been in practice since the early sixties, the 1971 seine season was opened by field announcement. The technique that was used is similar to that used in the Outer District - the individual runs are allowed to build up to a point where at least a minimal escapement is assured before opening. The 1971 pink run to the Southern District was both late and weak and as a result the seine

season did not begin until July 28, when Seldovia and Dogfish Bay were opened. The remainder of the district, with the exception of Port Graham and Upper Kachemak Bay, opened on August 9. Upper Kachemak Bay opened on August 12, after adequate escapement had been achieved at Humpy Creek.

The set gill net season opened on June 3 as scheduled. Two 24 hour periods per week were fished in the entire district until July 23 when the area east of Point Pogibshi was closed due to inadequate pink salmon escapements. By August 9 pink escapements had improved remarkably and fishing was again resumed. Despite the closure between July 23 and August 9, Southern District set netters enjoyed a better than average year on red salmon, which are their most important species.

Port Graham Bay remained closed to salmon fishing until August 17, when it was opened mainly for silvers. The reason for the extended closure was the lack of pink salmon escapement in the main head end stream.

The overall pink escapement into the Southern District was good with 105,000 being tallied in the four major study streams. The only weak spot was the Port Graham stream where an escapement of only 13 thousand was obtained, compared to the escapement goal of 50 thousand. Humpy Creek had 45 thousand, Tutka 16.7 thousand and Seldovia 31 thousand.

It should be pointed out that these escapements were obtained mainly because of the severe restrictions placed on the fishery. Without the imposed restrictions the 1971 escapements could well have been disastrous. Table 4 shows the pink escapements, by system, for the Southern and Outer Districts since 1962. The 1970 and 1971 ground stream surveys and aerial surveys by date appear in the appendix.

The major problem area of the Southern District in 1971 was the management of Humpy Creek pink salmon stocks. The parent year escapement of 5,000 was the lowest on record and every consideration was given to obtaining a good escapement from an expected low return. As mentioned above it was necessary to curtail both set nets and seines, but as an end result a satisfactory escapement of 45 thousand was realized.

Outer District:

The total salmon catch for the Outer District in 1971 was 431,520 and accounted for 25.6 percent of the total Cook Inlet catch. This was the highest odd year catch since 1955 and was slightly above the 18 year average (table 2)

The pink catch of 310,710 was the highest since 1955 while the chum catch of 118,995 was the highest since 1964. The pink salmon catches from 1954 to 1970 are shown in graphic form in figure 2.

The Outer District is regulated by field openings and has been since the early sixties. The first opening came on July 15 when the area from Harrington Point east to the boundary of the Eastern District was opened. This opening was justified by satisfactory red salmon escapements in the Delight, Desire, and Aialik systems and was for one 48 hour period only.

The second opening was on July 30 when the area from Point Adam to Chugach Bay was opened. Justification was good chum escapement in Dogfish Lagoon (2,600 chums in streams) and a good showing of pinks at Port Chatham. Windy, Rocky, and Port Dick were not opened at this time because of poor pink salmon escapements (Windy 1,300 pinks, Rocky 200 pinks, Port Dick 4,610 pinks).

On August 2, the area from South Nuka Bay to the Eastern District boundary was opened. Justification was good pink salmon escapement at South Nuka (7,000), good red escapement at Delight (5,000), Desire (1,200), and Aialik (3,000); and a strong showing of pinks along the beaches at Delight and Desire.

On Monday, August 9, the remainder of the Outer District (except for West Nuka Island) was opened to salmon fishing. The opening was justified by improved escapements at Windy (3,100 Windy Right: 6,900 Windy Left) and at Port Dick (weir count when opening was announced on August 6 was 10,976; count on August 9 was 17,396). Escapement at Rocky was still poor and thus stream markers were placed well outside.

The total pink salmon escapement in the major study streams in 1971 was 148,000 which is considered good. Port Dick received its highest recorded escapement with 97,800 being tallied. Windly Left and Windly Right also received better than average escapements with 35,400 and 13,000 respectively. Rocky River and Island Creek were both characteristically weak for an odd year with 1,600 and 100 fish respectively. Three major streams which are not included as study streams are Port Chatham, South Nuka, and Desire. These three systems all obtained good pink salmon escapement during 1971. Table 6 shows the total escapement in the study streams, and escapements by date, both ground and aerial appear in the appendix.

The major problem area in the Outer District during 1971 was Windy Bay where an unusual delay in the movement of pink salmon from the Outer Bay to the spawning stream occurred. As late as July 30 there were only 1,300 pinks in the two streams at the head of the bay. By the opening on August 9 we had obtained escapements of 3,100 in Windy Right and 6,900 in Windy Left. However, by this time many of the fish had moved into the intertidal flats and were rapidly becoming dark. The

harvest was 57 thousand pinks while the final escapement totaled 48 thousand. The escapement goal for the two streams was 20 thousand thus an estimated 28 thousand more fish might have been harvested. It should be noted however that the additional escapement in Windy Left pushed fish further up stream than had been observed in past years. This stream bears close watching in the next year or two and perhaps a re-evaluation of the 10,000 pink escapement goal should be made.

Kamishak District:

The total 1971 Kamishak District salmon catch was 58,545 and accounted for 3.5 percent of the Cook Inlet total salmon catch. This represents an average catch for this district. The catch by species since 1954 appears in table 3 and the catch by week in table 5.

The pink and chum catches accounted for 99.8 per cent of the total catch. The majority of the pinks were harvested in Bruin Bay and Ursus Cove with a few coming from Rocky Cove. Most of the chums came from Ursus and Cottonwood. There was no fishery on chums at McNeil, however a good escapement was obtained. The Kamishak catch and percent by species appears in table

The first opening occurred in the Kamishak District on July 28 at 12:00 noon when the area from Ursus Head to Cape Douglas was opened. Justification was improved escapements at McNeil (4,500 chums), Bruin (1,500 pinks), and Ursus (1,300 Pinks).

The second, and final opening, was on August 17 when the area north of Ursus Head (Cottonwood, Iliamna, and Iniskin Bays) was opened. Justification was that

sufficient numbers of chums were arriving in this district to warrant a fishery. The escapement at this time was 2,000 chums in Cottonwood, 5,000 chums in Iniskin.

Escapement is extremely difficult to monitor in this district due to the weather, location, and size of the area. Due to the physical problems of the area and lack of personnel there have been no ground escapement surveys conducted in the past. Aerial surveys have been made with larger planes such as the Cessna 185, Grumman Goose, and De Haviland Beaver. Under ideal conditions it is possible to make rough estimates using these type of aircraft, however on most surveys the main objective is to try to get distribution and pin-point areas of high abundance.

In general, escapement of pink and chum salmon in the Kamishak District was only fair during 1971. The major pink streams had the following peak escapement counts: Bruin (15,000), Ursus Browns Peak (7,000), and Sunday Creek (35,000). The peak escapement counts on the major chum systems were: Cottonwood (8,000), Iniskin (10,000), and McNeil (3,000). Red salmon escapement to Mikfik Lake was excellent. The peak count at Mikfik was a conservative 5,000 reds on July 15. Observations by a game biologist stationed at McNeil River, and the fact that all fish are not being seen on an aerial survey, lead us to believe that the total red escapement was close to 10,000. The aerial escapement estimates, by date, appear in the appendix.

One problem encountered during 1971 was the apparent inability of the Chenik Lake red salmon run to ascend the falls at the mouth of the stream. On two different surveys in early and mid-July approximately 2,000 reds were seen at the base of the falls. A survey in late July failed to locate any reds either at the mouth of the stream or in the main stream or lake. It is not known for certain if these fish were

wasted or if they made it to the lake at a later date. It is recommended that the falls be observed closely this next year and a determination be made as to whether a barrier exists.

Table 1. Salmon catch, by species, Southern District, 1954-1971.

Year	Kings	Reds	Cohos	Pinks	Chums	Total
1954	1,532	22,913	12,235	180,977	150,769	368,426
1955	562	30,848	3,230	565,216	24,398	624,254
1956	310	33,054	4,693	150,486	53,515	242,058
1957	286	19,431	1,507	130,511	57,403	209,138
1958	119	17,731	1,713	209,798	24,096	253,457
1959	74	10,026	709	50,076	15,278	76,163
1960	12	12,292	1,237	250,818	4,100	268,459
1961	39	10,180	1,161	191,911	2,924	206,215
1962	58	16,569	2,095	564,050	9,089	591,861
1963	88	13,142	4,020	99,829	7,695	124,774
1964	84	17,283	8,905	266,489	11,529	304,290
1965	10	11,229	733	90,330	2,459	104,761
1966	60	12,192	4,535	177,544	28,754	223,085
1967	173	26,350	2,393	95,100	23,416	147,432
1968	61	18,716	4,671	154,033	4,518	181,999
1969	59	12,578	513	70,878	2,588	86,616
1970	91	12,245	3,705	208,174	8,174	232,389
1971	41	18,403	3,151	50,066	2,857	74,518
18 year average	203	17,510	3,400	194,794	24,087	239,994
Percent	.08	7.30	1.42	81.16	10.04	100.00



Figure 1. Pink Salmon catches, Southern District, Cook Inlet, 1954 - 1970.

Table 2. Salmon catch, by species, Outer District, 1954-1971.

Year	Kings	Reds	Cohos	Pinks	Chums	Total
1954	13	4,927	368	82,205	112,877	200,391
1955	7	701	277	557,997	40,887	599,869
1956	23	2,889	190	42,368	19,248	64,718
1957	13	2,982	110	149,197	138,171	290,473
1958	1	1,719	83	739,768	100,386	841,957
1959	3	10,365	109	68,875	65,675	145,027
1960	4	1,336	533	328,501	67,187	397,561
1961	2	12,595	444	105,447	40,204	158,692
1962	2	8,697	1,893	1,684,023	126,750	1,821,365
1963	6	1,974	369	21,462	116,923	140,734
1964	2	1,370	431	767,396	269,512	1,038,711
1965	0	1,965	7	21,816	22,443	46,231
1966	1	2,710	357	398,751	87,620	489,439
1967	2	2,165	56	259,951	37,533	299,707
1968	1	1,550	106	191,691	20,283	213,631
1969	0	92	11	51,533	5,400	57,036
1970	5	4,177	243	302,879	118,746	426,050
1971	11	1,630	174	310,710	118,995	431,520
18 year average	5	3,547	320	338,032	83,824	425,728
Percent	-	.84	.07	79.40	19.69	100.00

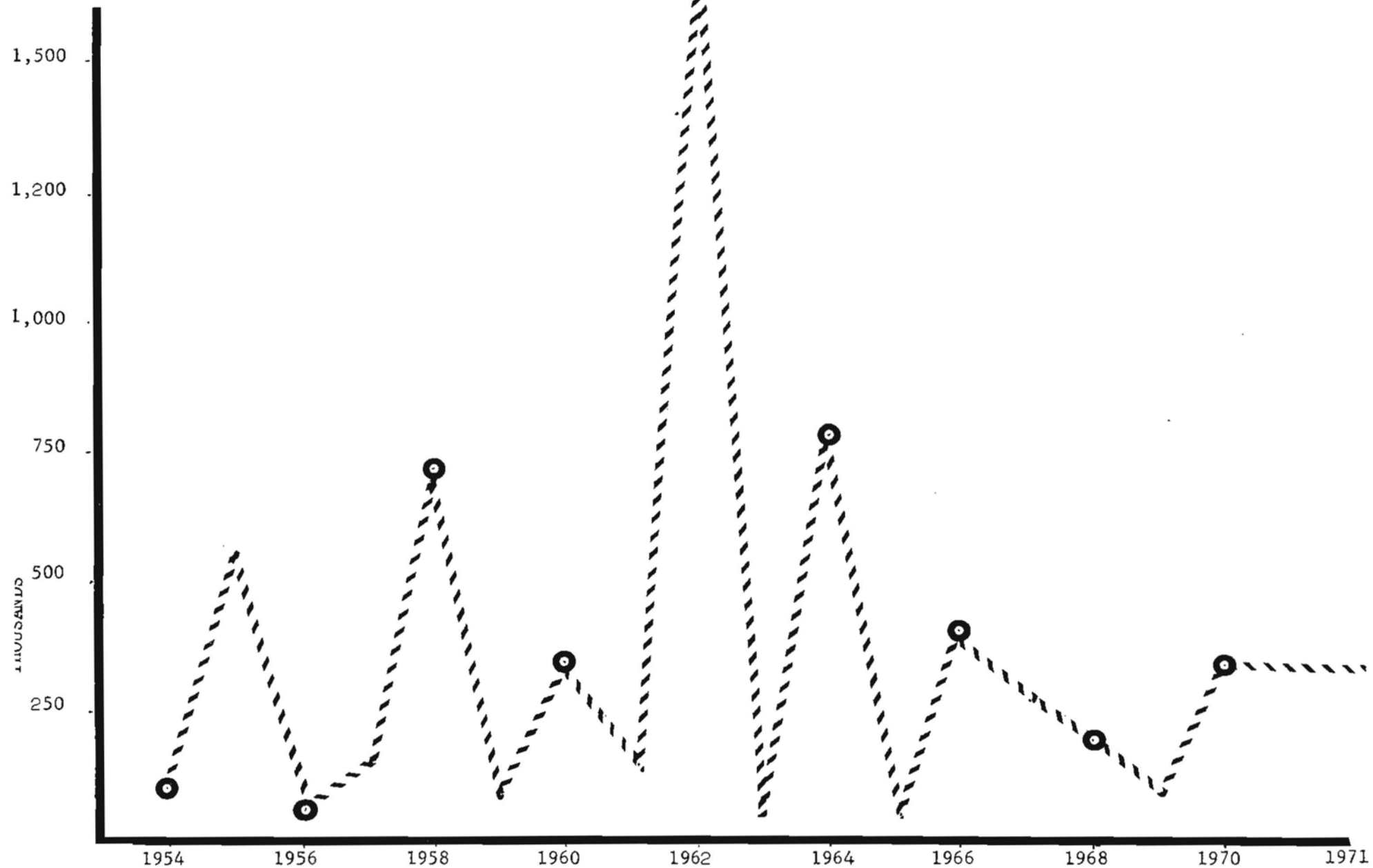


Figure 2. Pink salmon catches, Outer District, Cook Inlet, 1954 - 1970

Table 3. Salmon catch, by species, Kamishak District, 1954-1971.

Year	Kings	Reds	Cohos	Pinks	Chums	Tot.
1954		No fishery				
1955		2	8	5,121	278	5
1956		67	701	193	14,936	15
1957		4,335	29	5,905	10,856	21
1958		No fishery				
1959		1,549	43	5,325	25,759	32
1960	11	768	28	11,563	44,328	56
1961		1	14	6,019	12,465	18
1962		20	11	219	6,058	6
1963	1	4	97	82,314	13,892	96
1964	5	1,979	115	20,719	42,280	65
1965		808	4	3,452	2,706	6
1966	1	21	247	2,945	12,688	15
1967		182	74	17,340	24,221	41
1968		492	101	198,253	49,461	248
1969	2	10,727	4,094	76,459	52,936	144
1970		2,888	220	23,583	95,857	122
1971		3	121	32,094	26,327	58
16 year Average	1	1,490	369	30,719	27,190	59
Percent	-	2.49	.62	51.40	45.49	100

Table 4. 1971 Salmon catch and percent by species, Southern, Outer and Kamishak Districts, Cook Inlet.

District	Kings	Percent	Reds	Percent	Cohos	Percent	Pinks	Percent	Chums	Percent	Total
Southern	41	.06	18,403	24.69	3,151	4.23	50,066	67.19	2,857	3.83	74,518
Outer	11	.01	1,630	.38	174	.04	310,710	72.00	118,995	27.57	431,527
Kamishak	0	.00	3	.tr	121	.21	32,094	54.82	26,327	44.97	58,545
Total	55	0.01	20,040	3.55	3,421	0.60	392,877	69.59	148,179	26.25	564,572

Table 5. 1971 Salmon catch by week, Southern, Outer, and Kamishak Districts.

Week	SOUTHERN DISTRICT			OUTER DISTRICT			KAMISHAK DISTRICT		
	Pinks	Chums	Reds	Pinks	Chums	Reds	Pinks	Chums	Reds
24		1	443						
25	10	39	1,133						
26	116	135	2,486						
27	647	161	2,191						
28	1,804	167	5,122						
29	2,892	270	4,529	439	3	951			
30	1,659	187	1,730						
31	4,334	212	267	5,239	45,941		6,554	892	
32	20,569	170	69	81,179	26,994	303	6,721	5,151	
33	14,322	67	78	220,984	31,811	366	18,181	4,587	3
34	3,712	1,304	6	2,136	9,247		633	6,202	
35				80	4,999		5	6,556	
36		137						2,025	
Total	50,066	2,857	18,407	310,717	118,995	1,630	32,094	26,327	3

Week 24	June 6	---	June 12
25	June 13	---	June 19
26	June 20	---	June 26
27	June 27	---	July 3
28	July 4	---	July 10
29	July 11	---	July 17
30	July 18	---	July 24
31	July 25	---	July 31
32	Aug. 1	---	Aug. 7
33	Aug. 8	---	Aug. 14
34	Aug. 15	---	Aug. 21
35	Aug. 22	---	Aug. 28
36	Aug. 29	---	Sept. 4

Table 6. Estimated pink salmon escapements in thousands of fish.<sup>2/</sup>

Stream	1962	1963	1964	1965	1966	1967	1968	1969	1970	9-year average	1971
Humpy	56.0	34.7 <sup>1/</sup>	18.5 <sup>1/</sup>	28.0 <sup>1/</sup>	30.0	25.0	24.7	5.4	55.2	30.8	45.0
Tutka	30.0	10.0	20.0	20.0	12.0	7.0	7.9	6.5	6.5	13.3	16.7
Seldovia	50.0	15.0	60.0	30.0	86.0	55.0	53.2	60.0	23.0	48.0	31.1
Pt. Graham	50.0	2.0	16.0	1.5	24.0	2.0	24.4	4.0	16.6	15.6	13.2
Windy L.	12.5	4.5	7.7	10.0	7.0	6.0	6.9	23.0	13.0	10.0	35.4
Windy R.	12.5	4.9	6.2	2.0	7.0	6.0	2.8	3.2	2.1	5.2	13.0
Rocky	200.0	12.0	80.0	.3	44.0	1.0	43.1	1.0	32.0	45.9	1.6
Pt. Dick	40.0	16.0	31.5	50.0	35.0	20.0	29.0	12.0	34.5	29.8	92.8
Island	15.0	3.6	30.0	.5	7.0	.5	4.3	.1	5.5	7.4	.1
<sup>3/</sup> Total	466	103	270	142	252	123	196	115	190	206	254

<sup>1/</sup> Weir count.

<sup>2/</sup> Escapement estimates were derived from peak counts or calculated from counts made throughout the spawning season. When series counts were available the total fish/ days was divided by average stream life (2.5 wks) to estimate total escapement.

<sup>3/</sup> Rounded to nearest thousand.

Table 7. 1971 salmon catch by statistical area; Southern, Outer and Kamishak Districts.

Southern Area	Kings	Reds	Cohos	Pinks	Chums	Total
241-13, 15						
Upper Kachemak	11	1,289	1,499	11,442	26	14,267
241-16						
Tutka	29	10,010	196	10,252	476	20,963
241-17						
Seldovia		1,487	6	27,348	368	29,209
241-20, 30						
Port Graham	1	5,617	1,450	1,024	1,987	10,079
Total	41	18,403	3,151	50,066	2,857	74,518
Outer Area	Kings	Reds	Cohos	Pinks	Chums	Total
241-40						
Dogfish			54	10,419	114,489	124,962
242-10, 20						
Port Chatham		2	31	28,649	2,370	31,052
242-31						
Rocky				114	379	493
242-32						
Windy		1	54	57,257	1,029	58,341
242-41, 42, 43						
Port Dick		1	18	94,610	672	95,301
232-10, 21, 22, 23						
Nuka Bay		1,605	17	96,642	56	96,320
232-15						
Nuka Island		16		25,015		25,031
232-40						
Aialik	11	5		4		
Total	11	1,630	174	310,710	118,995	431,520
Kamishak Area	Kings	Reds	Cohos	Pinks	Chums	Total
243-10, 20, 30						
McNeil				3,959	13	3,972
243-40, 50, 60, 70						
Bruin		2	7	11,749	1,586	13,344
248-10, 70						
Ursus - Rocky		1	45	16,368	10,278	26,692
248-20, 30						
Cottonwood - Iniskin			69	18	14,450	14,537
Total	0	3	121	32,094	26,327	58,545

Table I. Ground stream surveys Southern District - 1971

DATE	STREAM	STREAM		INTERTIDAL STREAM		DISTRIBUTION	WEATHER	REMARKS
		PINKS	CHUMS	PINKS	CHUMS			
7/12/71	Tutka	0	0	0	0	Mouth 1/4 mi	Clear, calm	45° temp. 200 Pinks-lagoon-1000 Pinks bay
7/18/71	Tutka	0	0	50	10	Mouth 1/4 mi	Overcast, wind	1000+ Pinks-lagoon 2 boats, sport fish
7/19/71	Tutka	100	5	150	30	Lower sect.	Light rain	5000 Pinks-lagoon 1 boat, sport fish
7/26/71	Tutka	1600	0	2450	100	Lower sect.	Clear, calm	Lagoon not surveyed 1 boat, sport fish
7/27/71	Tutka	1429	0	1675	75	Lower sect.	Light rain	Approx. 4000 fish at mouth
8/10/71	Tutka	500	0	9800	0	Middle sect.	Overcast, calm	Approx. 400 dead Pinks-1000 P's lag & cha
8/23/71	Tutka	1000	5	6000	0	Lower sect.	Clear, calm	200+ dead P's stream-1000 dead P's Inter
9/ 4/71	Tutka	310	0	3530	0	Mouth 1/2 mi	Light rain	160 dead P's stream-8120 dead P's Inter
7/16/71	Humpy Cr.	0	0	0	0	2 miles	Overcast, wind	Surveyed to 50 yds past cabin
7/23/71	Humpy Cr.	157	0	0	0	Lower sect.	Overcast, calm	Surveyed to cabin
7/29/71	Humpy Cr.	1550	0	130	0	Middle sect.	Clear, calm	No fish above cabin
8/ 5/71	Humpy Cr.	10700	0	700	0	Middle sect.	Light rain	48° temp. 200 P's above Watson's cabin
8/17/71	Humpy Cr.	29400	0	1800	0	Length	Overcast, calm	46° temp. 1000 P's at mouth
9/ 2/71	Humpy Cr.	16700	0	1150	0	Length	Overcast, calm	4000 dead P's str. 2000 dead P's Inter
9/ 8/71	Humpy Cr.	16500	0	3000	0	Middle sect.	Clear, calm	No dead fish-little active spawning
7/23/71	Seldovia Cr.	295	156	0	0	Lower sect.	Light rain	Poor survey conditions
7/27/71	Seldovia Cr.	400	0	750	200	Lower sect.	Overcast, calm	Boat survey - 2-3000+ jumpers in Bay
7/30/71	Seldovia Cr.	550	30	1550	70	Middle sect.	Overcast, calm	45° temp. Several thousand pinks in Bay
8/ 3/71	Seldovia Cr.	1800	0	7700	200	Middle sect.	Clear, wind	1000+ Pinks off mouth-200 chum in r fork
8/12/71	Seldovia Cr.	4000	5	16000	100	Upper sect.	Overcast, calm	54° temp-Bay-1000 dead P's Inter-
8/26/71	Seldovia Cr.	4800	0	8200	0	Middle sect.	Overcast, calm	2000 dead P's str-8000 dead P's Inter.
7/26/71	Barabara Cr.	172	0	0	0	Mouth 1 mi	Overcast, wind	2 red tagged P's. One inter. One up cr.
8/ 5/71	Barabara Cr.	600	0	400	0	Middle sect.	Heavy rain	7 red tagged fish - upper intertidal
8/12/71	Barabara Cr.	2700	0	800	0	Upper sect.	Light rain	Several concentrations way up-gd gravel ar
8/26/71	Barabara Cr.	2100	0	500	0	Upper sect.	Overcast, calm	Few fish after 1 mile upstream-200 d P's s
7/20/71	Port Graham	30	230	120	300	Lower sect.	Clear, wind	2000 seen fr seiner-L-hand cr. 25 C's-2 P's
8/ 6/71	Port Graham	1500	300	2600	900	Upper Sect.	Clear, calm	L-hand cr. 400 Pinks 30 chum
8/24/71	Port Graham	5600	150	2100	10	Mouth 3 mi	Overcast, calm	L-hand cr. 1400 Pinks - 70 chums
9/13/71	Port Graham	893	37	107	0	Length	Overcast, calm	1000+ dolly varden
7/22/71	China Poot	0	0	0	0	Mouth	Overcast, wind	100 P's in bay left of stream-1 S.F. boat
8/ 8/71	China Poot	150		25				
8/22/71	China Poot	2065		1000		Middle sect.	Overcast, calm	

Table II a. Aerial stream surveys - Southern District - 1971

DATE	STREAM	NO. FISH DAY	SPECIES	NO. FISH STREAM	SPECIES	WEATHER	REMARKS
7/ 2/71	Seldovia	0	-----	0	-----	Clear, wind	-----
7/ 7/71	Seldovia	500	Pinks	0	-----	Clear, calm	-----
7/10/71	Seldovia	1,150	Pinks	0	-----	Clear, calm	Maybe some chums.
7/16/71	Seldovia	5,500	Pinks	50	Pinks	Clear, wind	-----
7/20/71	Seldovia	5,000	Pinks	300	Pinks	Overcast,wind	-----
7/26/71	Seldovia	1,700	Pinks	750	Pinks	Overcast,wind	-----
7/28/71	Seldovia	20,000	Pinks	1,500	Pinks	Clear, calm	Excellent visibility.
8/ 4/71	Seldovia	30,000	Pinks	9,500	Pinks	Clear, calm	-----
6/30/71	Port Graham	0	-----	0	-----	Overcast,wind	Put markers up on spit.
7/ 7/71	Port Graham	5,500	Chums	0	-----	Clear, calm	South side.
7/10/71	Port Graham	300	Chums	25	Chums	Clear, wind	-----
7/16/71	Port Graham	1,300	Chums	300	Chums	-----	-----
7/20/71	Port Graham	3,000	Pinks-chums	400	Chums	Overcast,wind	South side.
7/26/71	Port Graham	550	Pinks-chums	450	Pinks-chums	Overcast,wind	-----
7/28/71	Port Graham	2,000	Pinks	500	Pinks-chums	-----	-----
8/ 4/71	Port Graham	13,000	Pinks	2,700	Pinks	-----	-----
8/13/71	Port Graham	3,600	Pinks	9,900	Pinks	-----	3800 inter, 6100 lower & mdl stream
7/ 2/71	Tutka	0	-----	0	-----	Clear, wind	Lagoon & inter stream surveyed.
7/ 7/71	Tutka	0	-----	0	-----	Clear, wind	-----
7/10/71	Tutka	0	-----	0	-----	Clear, wind	Few fish inter.
7/16/71	Tutka	1,500	Pinks	50	Pinks	Clear, wind	-----
7/20/71	Tutka	4,000	Pinks	300	Pinks	Overcast,calm	Fish at head of lagoon & so. side.
7/26/71	Tutka	4,000	Pinks	750	Pinks	Overcast,wind	-----
7/29/71	Tutka	4,000	Pinks	4,000	Pinks	-----	-----
6/30/71	Barabara	25	Pinks	0	-----	Overcast,wind	-----
7/ 2/71	Barabara	0	-----	0	-----	Clear, wind	-----
7/ 7/71	Barabara	0	-----	0	-----	Clear, calm	Tide low.
7/16/71	Barabara	150	Pinks	0	-----	Clear, calm	-----
7/29/71	Barabara			0	-----	Overcast,wind	-----

Appendix Table II

Table II b. Aerial stream survey - Southern District - 1970

DATE	STREAM	NO. FISH BAY	SPECIES	NO. FISH STREAM	SPECIES	WEATHER VISIBILITY	REMARKS
6/28/70	Tutka	0	--	0	--	Good	5 seine boats
7/ 3/70	Tutka	0	--	0	--	Calm	2 seine boats
7/ 6/70	Tutka	0	--	0	--	Good	4 seine boats
7/16/70	Tutka	1,200	Pinks	0	--	Good	Lagoon
7/24/70	Tutka	1,400	Pinks	300	Pinks	Good	Lagoon
8/ 3/70	Tutka	5,000	Pinks	1,000	Pinks	Good	Lagoon
8/ 7/70	Tutka	6,500	Pinks				Lagoon and flats
8/14/70	Tutka	1,000	Pinks	2,000	Pinks	Good	90% intertidal spawning
6/28/70	Seldovia	0	--	0	--	Fair	One school herring
7/ 1/70	Seldovia	0	--	0	--	Fair	Slow fishing
7/ 3/70	Seldovia	350	Pinks	0	--	Fair	7 seine boats
7/ 6/70	Seldovia	1,000	Pinks	900	Pinks	Poor	1 seine boats
7/16/70	Seldovia	15,000	Pinks	500	Pinks	Good	3 seine boats
7/19/70	Seldovia			700	Pinks	Poor	Low tide
7/24/70	Seldovia			5,000	Pinks	Fair	80% Intertidal stream
7/29/70	Seldovia			3,400	Pinks	Fair	60% Intertidal stream
8/ 3/70	Seldovia			4,000	Pinks	Good	50% Intertidal stream
8/27/70	Seldovia	400	Pinks	5,000	Pinks		70% Intertidal stream
6/28/70	Port Graham	2		0		Fair	Jumpers
7/ 2/70	Port Graham	0		0		Poor	2 seine boats
7/ 3/70	Port Graham	0		0		Calm	2 seine boats
7/13/70	Port Graham	1,000	Chums	0		Poor	On flats
7/16/70	Port Graham	2,600	Pinks, Chums	1,800	Pinks, Chum	Good	3 seine boats
7/24/70	Port Graham	1,600	Pinks	3,400	Pinks	Good	Few dead chums
7/27/70	Port Graham			2,600	Pinks	Poor	Head stream
8/ 7/70	Port Graham			4,600	Pinks		30% Intertidal
6/28/70	Barabara	350	Pinks	0		Fair	2 schools
7/ 3/70	Barabara	0		0		Poor	Slow fishing
7/ 6/70	Barabara	250	Pinks	0		Fair	At mouth
7/16/70	Barabara	3,600	Pinks	0		Good	
7/19/70	Barabara			100	Pinks	Poor	-4.6 low tide
7/24/70	Barabara	3,500	Pinks	350	Pinks	Good	

Table III a. Ground stream survey - Outer District - 1971

DATE	STREAM	STREAM		INTERSTITIAL		DISTRIBUTION	WEATHER	REMARKS
		PINKS	CHUMS	PINKS	CHUMS			
8/31/71	Port Chatham <sup>1/</sup>	3050	0	250	0	Length	Overcast, calm	1100 P's dead str. 80 P's dead intr. 44°
8/31/71	Port Chatham <sup>2/</sup>	880	0	2450	1	Lower sect.	Light rain	Heaviest spawning in left cr.
8/31/71	Port Chatham <sup>3/</sup>	1650	100	800	50	Middle sect.	Overcast, calm	Stream averages 10 ft. wide
8/11/71	Rocky River	800	4000		400	Middle sect.	Overcast, calm	300 dolly varden
8/27/71	Rocky River	920	3700		300	Upper sect.	Overcast, calm	100 cohos-minimum estimates-44° temp.
7/28/71	Port Dick Cr	3000 <sup>4/</sup>	0	875	2750	Length	Overcast, wind	
8/19/71	Port Dick Cr	31000		14000		Length	Overcast, calm	Peak count: 2000 in meadow area
9/12/71	Port Dick Cr	1950	30	800	10	Length	Clear, calm	Several thousand dead
7/20/71 <sup>7-7h</sup>	Island cr.		123	0	0	Length	Overcast, wind	
7/29/71 <sup>7-7h</sup>	Island Cr.	1	348	0	0	Length	Overcast, calm	
8/6/71 <sup>7-7h</sup>	Island Cr.	0	475	0	500	Length	Clear, wind	
8/14/71 <sup>7-7h</sup>	Island Cr.	0	1050	0	2150	Intertidal	Clear, calm	750 fish in left fork - 300 in right fork
8/20/71 <sup>7-7h</sup>	Island Cr.	0	3400	0	2000+	Length	Light rain	2950 C's in left fork - 450 in right fork
7/29/71	Middle Cr.	0	18	0	0	Lower sect.	Overcast, calm	Small schools of pinks on flats.
7/15/71	Middle Cr.	30	50					
8/7/71	Middle Cr.	5	18	0	0	Mouth	Overcast, wind	
8/14/71	Middle Cr.	30	50	0	0	Lower sect.	Clear, Calm	Approx. 2000 Pinks in Bay.

- <sup>1/</sup> North Arm - South Creek  
<sup>2/</sup> North Arm - Waterfall Creek  
<sup>3/</sup> South Arm Creek  
<sup>4/</sup> Weir Count

Table III b. Ground stream surveys - Outer District - 1971

DATE	STREAM	STREAM	STREAM	INTERTIDAL STREAM		DISTRIBUTION	WEATHER	REMARKS
		PINKS	CHUMS	PINKS	CHUMS			
7/21/71	Dogfish L.Cr.	0	500	0	0	Lower sect.	Overcast, wind	5000 + fish in lagoon area
7/27/71	Dogfish L.Cr.	0	450	0	600	Middle sect.	Light rain	10-20,000 chums-lagoon. boat survey
7/30/71	Dogfish L.Cr.	0	400	0	850	Lower sect.	Overcast, calm	50 dead chums-stream. 10 dead chums-inter
9/ 1/71	Dogfish L.Cr.	156	37	0	0	Middle sect.	Clear, wind	100 dead pinks - 200 dead chums
7/21/71	Dogfish H.E.	0	700	0	0	Lower sect.	Overcast, wind	
7/27/71	Dogfish H.E.	0	300	25	350	Middle sect.	Overcast, calm	2-3000 P's-bay-10-20000 C's bay-boat sur
7/30/71	Dogfish H.E.	25	775	25	525	Lower sect.	Light rain	100+ P's off mouth-500-1000 C's off mout
9/ 1/71	Dogfish H.E.	90	580	60	1200	Middle sect.	Clear, wind	53 dead P's-str. 480 dead C's str.
8/ 2/71	Windy Left	260	70	700	100	Lower sect.	Clear, calm	46° temp. 500+ fish off mouth
8/ 2/71	Windy Left	3400	200	3500	0	Middle sect.	Overcast, calm	5-10,000 inside markers
9/ 3/71	Windy Left	14250	10	3100	0	Upper sect.	Overcast, calm	11-bear-fish farther up both forks pr yr
9/14/71	Windy Left	228	4	48	2	Mouth 4 mi	Light rain	3000 Dolly varden
7/27/71	Windy Right	20	500	0	0	Lower sect.	Light rain	Boat survey
8/ 2/71	Windy Right	400	600	0	0	Middle sect.	Clear, calm	Most spawning at head of meadow
8/ 9/71	Windy Right	2300	200	800	100	Length	Overcast, calm	5-10,000 inside markers
9/ 3/71	Windy Right	5080	0	1060	1	Upper sect.	Overcast, calm	7810 dead pinks stream-2000 dead P's int
9/14/71	Windy Right	400	0	38	0	Length	Overcast, calm	500+ dolly varden-fish remaining spawn-c

## Appendix

Table IV a. Aerial stream surveys Outer District - 1971

DATE	STREAM	NO. FISH CAY	SPECIES	NO. FISH STREAM	SPECIES	WEATHER	REMARKS
6/25/71	Port Dick	0	-----	0	-----	Clear, calm	Herring or candle fish in Bay.
7/ 2/71	Port Dick	0	-----	0	-----	Clear, wind	
7/ 6/71	Port Dick	1,800	Chums	500	Chums	Clear, wind	Lots of herring, few pinks.
7/ 7/71	Port Dick			400	Chums	Clear, wind	
7/ 9/71	Port Dick	6,000	Chums			Clear, calm	
7/16/71	Port Dick	2,000	Chums	300	Pinks	Clear, wind	
7/20/71	Port Dick	5,000	Pinks-Chums	2,000	Chums	Overcast, wind	Fish along north shore.
7/27/71	Port Dick	34,600	Pinks-Chums			Overcast, calm	
7/28/71	Port Dick	26,800	Pinks-Chums			Clear, wind	Most on south side.
7/29/71	Port Dick	70,000	Pinks				34000 n. side-34000s.side-3,000 flats
8/ 4/71	Port Dick	40,000	Pinks	1,000	Pinks		Intertidal stream.
8/ 6/71	Port Dick	62,000	Pinks				12000 S. side - 50000 N. side.
7/ 7/71 <sup>8-19</sup>	Middle	1,600	Chums			Clear, wind	
7/ 9/71 <sup>9-12</sup>	Middle	200	Chums			Clear, calm	
7/20/71 <sup>7-5</sup>	Middle	500	Pinks			Overcast, wind	
7/27/71	Middle	200	Pinks-Chums	200	Chums	Overcast, calm	Left creek.
7/28/71	Middle	1,800					Flats
7/ 7/71	Island	0	-----	0	-----	Clear, wind	
7/ 9/71	Island			5	Chums	Clear, calm	
7/20/71	Island	700	Chums	0	-----	Overcast, wind	
7/27/71	Island	200	Pinks-Chums	150	Chums	Overcast, calm	Left creek.
7/28/71	Island	800		200	Chums		
8/ 4/71	Island			1,500	Pinks-Chums		
9/12/71	Island			3,000	Chums		No Pinks.

Appendix

Table IV b. Aerial stream surveys - Outer District - 1971

DATE	STREAM	NO. FISH BAY	SPECIES	NO. FISH STREAM	SPECIES	WEATHER	REMARKS
6/30/71	Windy Bay	0	-----	0	-----	Overcast, calm	-----
7/ 2/71	Windy Bay	50	Chums	0	-----	Clear, wind	Just north side surveyed.
7/ 7/71	Windy Bay	0	-----	30	Chums	Clear, wind	
7/10/71	Windy Bay	1,300	Chums	150	Chums	Clear, wind	
7/16/71	Windy Bay	3,600	Pinks	0	-----	Clear, wind	
7/20/71	Windy Bay	4,500	Pinks	500	Chums	Overcast, wind	Fish along north shore.
7/27/71	Windy Bay	35,000	Pinks	0	-----	Overcast, calm	Along entire shoreline.
7/28/71	Windy Bay	59,000	Pinks	2,000	Chums	-----	-----
8/ 4/71	Windy Bay	44,000	Pinks	8,000	Pinks	1000 left cr.	by waterfall-7000 inter. area
8/ 6/71	Windy Bay	40,000	Pinks				Several thousand intertidal.
8/11/71	Windy Bay	30,000	Pinks				Moved markers way in.
7/29/71	Windy Left	40,000	Pinks	2,000	Pinks		On flats
8/13/71	Windy Left	25,000	Pinks				Mouth - good spawning stream.
7/26/71	Windy Right			200	Chums	Overcast, wind	
7/27/71	Windy Right	300	Pinks-Chums	350	Chums	Overcast, calm	
8/13/71	Windy Right	18,000					1000 upper inter.-3000 mt. stream
7/ 2/71	Rocky	0	-----	0	-----	Clear, wind	
7/10/71	Rocky	400	Chums	0	-----	Clear, wind	
7/16/71	Rocky	300	Pinks-Chums	0	-----	Clear, wind	
7/20/71	Rocky	0	-----	4	-----	Overcast, wind	
7/26/71	Rocky			270	Chums	Overcast, wind	
7/28/71	Rocky			350	Pinks-Chums-Reds		
7/29/71	Rocky	3,800	Pinks				Mostly around mouth.
8/ 4/71	Rocky	7,500	Pinks	700	Pinks-Chums	-----	-----
8/ 6/71	Rocky	3,500	Pinks				On flats.
8/13/71	Rocky	200		8,300	Pinks-Chums		Excellent chum run.

Table IV c. Aerial stream survey - Outer District - 1971

DATE	STREAM	NO. FISH BAY	SPECIES	NO. FISH STREAM	SPECIES	WEATHER	REMARKS
6/30/71	Dogfish	25	Chums		-----	Overcast, wind	Put 2 markers up outside.
7/ 7/71	Dogfish	100	Chums			Clear, calm	None along outside beach.
7/10/71	Dogfish	800	Chums			Clear, wind	
7/20/71	Dogfish	8,500	Chums			Overcast, calm	
7/26/71	Dogfish	10,000	Chums	750	Chums	Overcast, wind	
7/28/71	Dogfish	30,000	Chums				
8/13/71	Dogfish	53,000	Chums			Overcast, calm	
7/20/71	Dogfish Left			600	Chums	Overcast, calm	
7/26/71	Dogfish Left			750	Chums	Overcast, wind	
7/28/71	Dogfish Left			1,200	Chums		
8/ 4/71	Dogfish Left			3,000	Chums		
8/13/71	Dogfish Left			2,000	Chums		
7/20/71	Dogfish Head			0	-----	Overcast, calm	
8/13/71	Dogfish Head			2,000	Chums	Overcast, calm	
6/30/71	Port Chatham	-----	-----	---	-----	Overcast, wind	
7/ 7/71	Port Chatham	-----	-----	---	-----	Clear, wind	
7/10/71	Port Chatham	700	Chums	---	-----	Clear, wind	
7/16/71	Port Chatham	800	Chums	300	Chums	Clear, wind	
7/20/71	Port Chatham	5,000	Pinks-Chums	200	Chums	Overcast, calm	Fish along outside spit.
7/26/71	Port Chatham	1,500	Pinks-Chums	350	Pinks-Chums	Overcast, wind	
7/28/71	Port Chatham	15,000	Pinks-Chums	1,000	Chums		
8/ 4/71	Port Chatham	8,000	Pinks	600	Pinks		
8/13/71	Port Chatham	1,000		5,700			Good spawn (Left)
8/13/71	Port Chatham			9,800			Right

Table IV d. Aerial stream survey - Outer District - 1971

DATE	STREAM	NO. FISH BAY	SPECIES	NO. FISH STREAM	SPECIES	WEATHER	REMARKS
6/25/71	So. Nuka	0	----	0	----	Clear, calm	
7/ 6/71	So. Nuka	200	Pinks			Clear, wind	
7/ 9/71	So. Nuka	2,500	Pinks			Clear, calm	
7/14/71	So. Nuka	3,000	Pinks			Clear, calm	
7/27/71	So. Nuka	4,000	Pinks	4,000	Pinks	Overcast, calm	
7/29/71	So. Nuka	7,000	Pinks	1,000	Pinks		No fish along west side.
8/ 6/71	So. Nuka	500		7,000	Pinks		No fish along west side.
9/12/71	So. Nuka			1,000	Pinks		5 to 10,000 dead pinks.
6/25/71	Delight	100	Reds			Clear, Calm	Lake frozen over
7/ 6/71	Delight	200	Reds			Clear, wind	
7/ 9/71	Delight	3,600	Reds	1,000	Reds	Clear, calm	Ice break-up lake.
7/14/71	Delight	2,000	Reds	500	Reds	Clear, calm	
7/29/71	Delight	5,000	Pinks	5,000	Reds		
8/11/71	Delight			6,000	Pinks-Reds		1000 stream - 5000 lake
9/12/71	Delight			5,300	Pinks-Cohos		few reds still alive in lak
6/25/71	Desire	5	Reds				Lake frozen over.
7/ 6/71	Desire	800	Reds				
7/ 9/71	Desire	5,000	Reds				Ice on lake.
7/14/71	Desire	5,000	Reds				Ice out now.
7/29/71	Desire	12,000	Pinks	1,200	Reds		
8/11/71	Desire			20,000	Pinks		
9/12/71	Desire			25,100	Pinks-cohos		5000 dead pinks.
6/25/71	Aialik	0		0		Clear, Calm	Slough above lagoon frozen.
7/ 9/71	Aialik	7,000	Reds			Clear, Calm	Ice on lake.
7/29/71	Aialik			3,000	Reds		Escapement in upper lake.

Table V a. Aerial stream survey - Outer District - 1970

DATE	STREAM	NO. FISH BAY	SPECIES	NO. FISH STREAM	SPECIES	WEATHER VISIBILITY	REMARKS
6/25/70	Port Dick	0	--	0	--	Poor	One school herring
7/ 1/70	Port Dick	6,500	Chums	0	--	Fair	Off flats
7/ 3/70	Port Dick	10,000	Chums	100	Chums	Fair	Flats and North Side
7/ 6/70	Port Dick	4,500	Chums	400	Chums	Good	Flats
7/13/70	Port Dick			1,000	Chums	Poor	Lower Creek
7/16/70	Port Dick	12,000	Pinks, Chums	1,500	Chums	Good	North Side - 5,000 Pinks
				150	Pinks		On South Side Bay
7/22/70	Port Dick	43,000	Pinks	2,400	Pinks	Fair	10% chums in Bay
7/24/70	Port Dick			4,600	Pinks	Fair	3,000 pinks 2nd hole
				5,000	Chums		
7/27/70	Port Dick	5,000	Pinks	6,000	Pinks	Poor	16 seine boats
8/ 3/70	Port Dick	4,500	Pinks			Excellent	Flats 15,000 Pinks South Side
8/ 7/70	Port Dick	7,500	Pinks				Flats
8/14/70	Port Dick	1,500	Pinks	18,000	Pinks	Fair	Flats
7/ 1/70	Middle Creek	Jumpers		0		Fair	
7/ 3/70	Middle Creek	3,000	Chums	0		Fair	Along drop off
7/ 6/70	Middle Creek	7,000	Chums	50	Chums	Good	Flats
7/16/70	Middle Creek	2,500	Chums	200	Chums	Good	Flats and east side
		3,500	Pinks				
7/22/70	Middle Creek	10,000	Pinks	500	Chums	Fair	
7/27/70	Middle Creek			500	Chums	Poor	
8/ 3/70	Middle Creek	7,500	Pinks	900	Chums	Good	Flats and east side
8/ 7/70	Middle Creek	4,500	Pinks			Fair	Flats
8/14/70	Middle Creek					Fair	Pinks in stream
7/ 1/70	Island Creek	0		0		Fair	
7/ 3/70	Island Creek	900	Chums	0		Fair	Flats
7/ 6/70	Island Creek	0		0		Poor	50 seals
7/16/70	Island Creek	Jumpers	Chums	350	Chums	Fair	Chums spawning
7/22/70	Island Creek	6,500	Pinks	850	Chums	Fair	Intertidal
7/27/70	Island Creek	4,500	Pinks	2,200	Chums	Fair	Good Spawning
8/ 3/70	Island Creek	3,500	Pinks	1,000+	Chums	Good	
8/ 7/70	Island Creek						Pinks in stream
8/14/70	Island Creek	1,000	Pinks	7,500	Pinks	Fair	Good escapement

Table V D. Inlet Stream Surveys Outer District, 1970

DATE	STREAM	NO FISH CATCH	SPECIES	NO FISH CATCH	SPECIES	WEATHER VISIBILITY	REMARKS
7/2/70	Dogfish	0	--	0	--	Poor	
7/3/70	Dogfish	300	Chums	0	--	Good	Lagoon
7/6/70	Dogfish	900	Chums	0	--	Fair	Lagoon
7/18/70	Dogfish	6,000+	Chums	1,000	Chums	Good	Left Creek: 50 Chums - Head Cree
7/19/70	Dogfish	Jumpers	Chums	75	Chums	Poor	Head Stream
7/22/70	Dogfish	2,000	Chums	1,700	Chums	Fair	Left Stream: 500 Chums-Head Strea
7/27/70	Dogfish	Jumpers	Chums	900	Chums		Head Stream
				4,000	Chums		2 left streams
8/7/70	Dogfish			6,000	Chums, Pinks		4,500 Head - 1,500 Left
7/2/70	Port Chatham	0	--	0	--	Poor	
7/3/70	Port Chatham	0	--	0	--	Good	
7/6/70	Port Chatham	75	Chums	0	--	Fair	Along spit
7/16/70	Port Chatham	2,500	Chums	0	--	Good	1,000 Chums at Mouth Left Creek
7/19/70	Port Chatham	250	Chums	0	--	Poor	
7/22/70	Port Chatham	1,500	Pinks	450	Pinks, Chums	Fair	Left Creek
7/27/70	Port Chatham	4,000	Pinks, Chums	750	Pinks, Chums	Fair	Few both creeks
8/7/70	Port Chatham			Good			Left Stream
				Poor			Right Stream
7/1/70	Windy	3,000	Chums	0		Good	
7/2/70	Windy	0	--	0		Poor	
7/3/70	Windy	3,000	Chums	0		Good	
7/6/70	Windy	350	Chums	0		Poor	
7/16/70	Windy	8,000	Pinks, Chums	1,200	Chums	Good	Right Stream
7/19/70	Windy	4,000+	Pinks			Poor	
7/22/70	Windy	200	Pinks	2,000	Chums	Fair	Right Stream
7/24/70	Windy	750	Pinks	100	Pinks	Poor	Left Stream
				500	Pinks		Right Stream - Good Chum spawning
7/27/70	Windy	2,700	Pinks	5,000	Pinks	Good	1,500 Windy Right - 3500 Windy Left
8/3/70	Windy			5,500	Pinks		3,500 Windy Left - 2000 Windy Right
7/2/70	Rocky	0	--	0	--	Poor	
7/3/70	Rocky	0	--	0	--	Good	
7/6/70	Rocky	0	--	0	--	Poor	
7/16/70	Rocky	2,200	Pinks	80	Pinks	Good	East Beach
7/19/70	Rocky	Jumpers	Pinks			Poor	East Beach
7/22/70	Rocky	900	Pinks	300	Pinks, Chums	Fair	Left Fork
7/24/70	Rocky	8,100	Pinks	5,300	Pinks	Fair	8,100 Intertidal
7/27/70	Rocky	48,700	Pinks	8,500	Pinks	Good	

Table V c. Aerial stream surveys - Outer District - 1970

DATE	STREAM	NO. FISH BAY	SPECIES	NO. FISH STREAM	SPECIES	VISIBILITY WEATHER	REMARKS
6/25/70	So. Nuka	0	--	0	--	Overcast, calm	
7/ 6/70	So. Nuka	1,000	Pinks	0	--	Overcast, calm	
7/16/70	So. Nuka	3,000	Pinks	1,500	Pinks	Slight wind	
7/22/70	So. Nuka	4,000	Pinks	11,000	Pinks	Poor Visibility	
6/25/70	Delight	Jumpers	Reds	20	Reds	Overcast, calm	In Lake.
7/ 6/70	Delight			1,200	Reds	Overcast, calm	In Lake.
7/22/70	Delight			4,600	Reds	Excellent Visibility	Lake and stream.
6/25/70	Desire	0	--	0	--	Overcast, calm	
7/ 6/70	Desire	0	--	800	Reds	Overcast, calm	In Lake
7/22/70	Desire	0	--	2,000	Reds	Excellent Visibility	Lake
6/25/70	Aialik	Jumpers	Reds	0	--	Overcast, calm	Near Head Stream
7/ 6/70	Aialik	9,000	Reds	0	--	Overcast, calm	Lagoon

# Appendix

Table VI a.      Special stream survey--Chinitna Bay District  
1971

DATE	STREAM	NO. FISH DAYS	SPADIN	NO. FISH STREAM	SPECIES	WEATHER	REMARKS
7-15-71	Chinitna	---	----	---	----	Clear, calm	2 black bears.
8- 9-71	Chinitna	---	----	250	Chums	-----	Good visibility.
8-16-71	Chinitna	---	----	5,000	Chums	Overcast, calm	-----
9- 3-71	Chinitna	---	----	17,000	Chums	Overcast, calm	-----
7-15-71	Iniskin left	0	----	0	----	Clear, calm	4 brown bears (2 cubs)
8-9-71	Iniskin left	---	----	1,000	Pinks	-----	-----
	Iniskin	---	----	50	Pinks	-----	Upstream
8-16-71	Portage Creek	---	----	500	Chums	Overcast, calm	Good visibility.
	Iniskin Head	---	----	5,000	Chums	Overcast, calm	Good visibility.
	Iniskin Right	---	----	1,200	Pinks	Overcast, calm	Good visibility.
9- 3-71	Portage Creek	---	----	0	----	-----	Good visibility.
	Iniskin Head	---	----	10,000	Chums	Overcast, calm	Good visibility.
	Iniskin Right	---	----	500	Pinks	Overcast, calm	Good visibility.
7-15-71	North Head	0	----	0	----	Clear, calm	-----
8- 9-71	North Head	0	----	100	Pinks	-----	-----
8-16-71	North Head	0	----	5,000	Pinks	Overcast, calm	Good visibility.
8- 9-71	Cottonwood	---	----	3	Chums	-----	-----
8-16-71	Cottonwood	---	----	2,000	Chums	Overcast, calm	Good visibility.
9- 3-71	Cottonwood	---	----	8,000	Chums	Overcast, calm	Many dead salmon, good vis.

# Appendix

Table VI b. Aerial stream survey,--Glenishak Bay, Dis. rld.  
1971

DATE	STREAM	LC. WITH BAYS	SPECIES	NO. FISH STREAMS	SPECIES	WEATHER	REMARKS
7- 7-71	Bruin Head	0	----	0	----	Clear, calm	-----
7-15-71	Bruin Head	0	----	20	Reds	Clear, wind	3 bears, 2 moose
7-21-71	Bruin Head	---	----	---	----	Bad	No flight.
7-28-71	Bruin Head	---	----	1,500	Pinks	-----	Poor visibility, 4 brown bears
8- 9-71	Bruin Head	---	----	2,400	Pinks	-----	1400 upstream, 1000 hole, 7 be
8-16-71	Bruin Head	---	----	4,000	Pinks	Overcast, calm	Good visibility.
	Bruin Right	---	----	2,000	Pinks, Chums	Overcast, calm	Good visibility.
9- 3-71	Bruin Head	---	----	15,000	Pinks	Overcast, calm	Good visibility.
7-15-71	Brown's Peak	500	Pinks	----	----	Clear, calm	Lower end.
7-28-71	Brown's Peak	---	----	1,300	Pinks	-----	Fair visibility, 6 boats.
8- 9-71	Brown's Peak	---	----	6,350	Pinks	-----	350 stream, 6000 lagoon.
8-16-71	Brown's Peak	---	----	7,000	Pinks	Overcast, calm	Good visibility, 6000 lagoon.
9- 3-71	Brown's Peak	---	----	3,000	Pinks	Overcast, calm	Very few dead salmon observed.
7-15-71	Ursus Right	---	----	---	----	Clear, calm	Lower end survey.
	Ursus Beaches	500	Pinks, Chums	0	----	Clear, calm	West, Southern, Outer.
8- 9-71	Ursus Left	---	----	1	?	Clear, calm	None in right stream.
7-15-71	Sunday Creek	100	Chums	---	----	Clear, calm	
	Sunday Creek	1,100	Pinks	---	----	Clear, calm	
7-23-71	Sunday Creek	---	----	300	Pinks	-----	Fair visibility.
8- 9-71	Sunday Creek	---	----	6,500	Pinks	-----	4000 lower stream.
8-16-71	Sunday Creek	---	----	15,000	Pinks	Overcast, calm	Visibility good.
9- 3-71	Sunday Creek	---	----	35,000	Pinks	Overcast, calm	Not at peak.

## Appendix

Table VI c. Aerial stream surveys--Kamishak Bay District  
1971

DATE	STREAM	NO. FISH COUNT	SPECIES	NO. FISH COUNT	SPECIES	WEATHER	REMARKS
7- 7-71	Amakdedori	0	----	50	Reds	Clear, wind	Excellent visibility.
7-15-71	Amakdedori	300	Reds	1,200	Reds	Clear, wind	Good vis. stream, fair beaches.
7-28-71	Amakdedori	---	----	1,000	Reds	-----	Fair vis., bright red above.
7- 7-71	Chenik	2,000	Reds	0	----	Clear, wind	Good vis., at first falls.
7-15-71	Chenik	2,000	Reds	0	----	Clear, wind	Good vis., stream and lake.
7-28-71	Chenik	0	----	-	----	-----	Poor vis., none falls or stream
7- 7-71	Chenik Lake	0	----	0	----	Clear, calm	Excellent visibility.
7- 7-71	McNeil	8	Chums	0	----	-----	Good vis.
7-15-71	McNeil	1,000	Chums	300	Chums	Clear, wind	Good vis. stream, fair in Bay.
7-28-71	McNeil	3,000	Chums	1,500	Chums	-----	Good vis., fish below falls
7- 7-71	Mikfik Lake	1,500	Reds	300	Reds	Clear, calm	2000 Reds in Lake.
7-15-71	Mikfik Lake	---	----	---	----	-----	5000 Reds.
7- 7-71	Douglas River	0	----	0	----	Clear, calm	Excellent vis., murky water.
7- 7-71	Kamishak	0	----	0	----	Clear, calm	Excellent vis., murky water.
7- 7-71	Strike Creek	0	----	0	----	Clear, calm	Excellent vis., 2 brown bear.

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## SHELLFISH SECTION

### KING CRAB

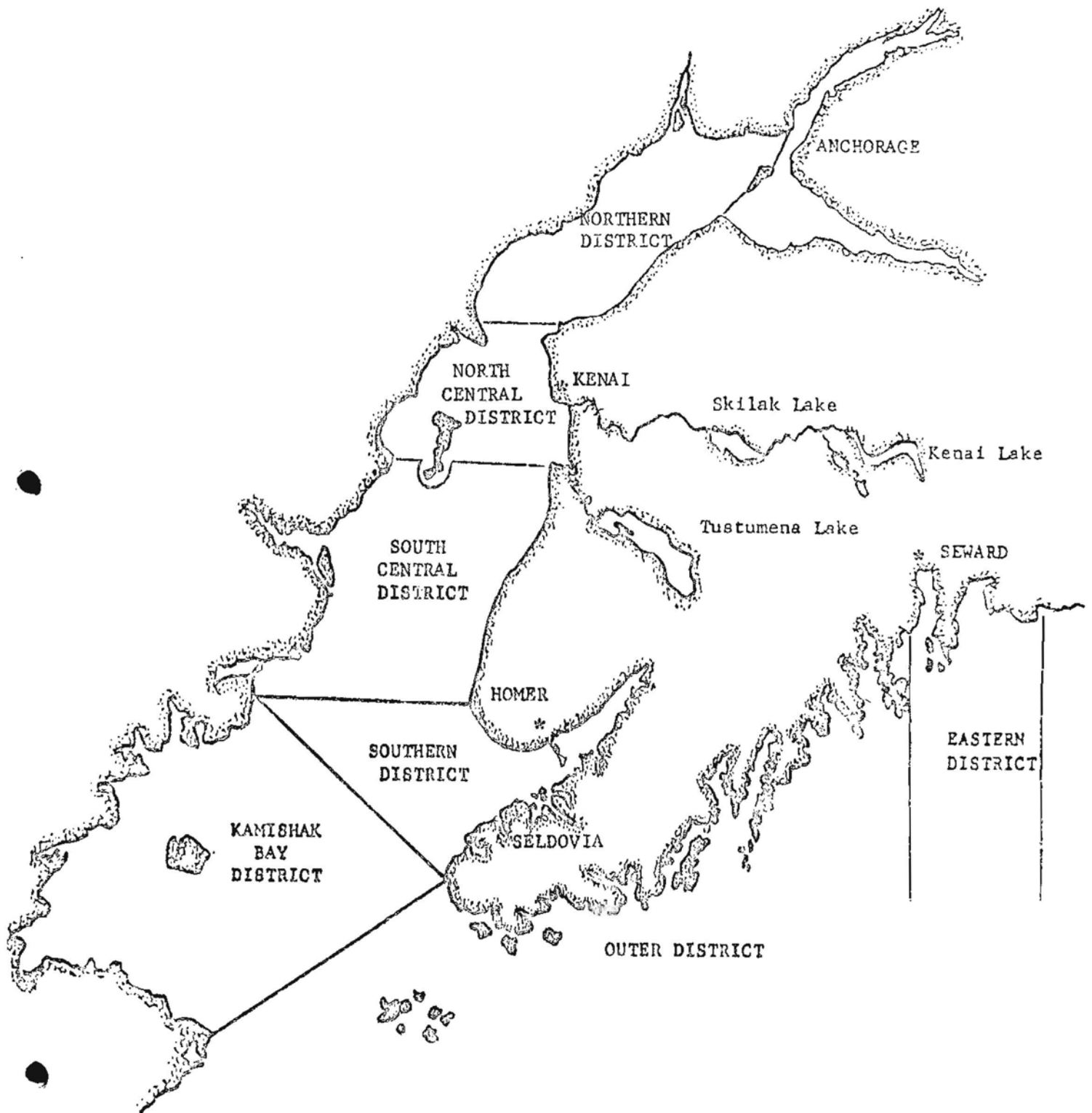
#### Management Areas

The Cook Inlet area is currently divided into three basic king crab management areas. These are the Southern, Kamishak, and Outer districts. (Figure 1 ). The average king crab catch by district since 1960 is as follows:

The Southern district, or Kachemak Bay Area ---	2.0 million lbs.
The Kamishak district -----	2.7 million lbs.
The Outer district -----	150 thousand lbs.

Presently the Outer district includes all waters south and east of a line from Cape Douglas to Point Adam, west of the Eastern district boundary, and north of the latitude of Cape Douglas. Since this encompasses an extremely large area with primarily two different types of crab fisheries, it is the staffs intention to divide the Outer district into two crab management areas next year. The statistical areas in the vicinity of the Barren Islands have contributed a major share toward the Kamishak/Outer district quota during the past two years. The staffs intention is to create a Barren Islands district which would be bounded on the north by a line from Cape Douglas to Point Adam, on the east by the longitude of Elizabeth Island, and the south by the latitude of Cape Douglas.

Figure 1  
ALASKA DEPARTMENT OF FISH AND GAME  
DIVISION OF COMMERCIAL FISHERIES  
COOK INLET - RESURRECTION BAY AREA



This new district would thus contain statistical areas 248-61, 249-21, and 241-51. (Figure 2 ).

The remainder of the Outer district or that area east of Elizabeth Island is primarily a bay fishery with minimal offshore fishing activity. The catches in the area have been relatively insignificant when compared to the portion of the Outer district west of Elizabeth Island. The catch by district since 1968, as it would appear under the new district plan, is shown in Table 1 .

#### Brief History of Fishery

The king crab fishery in Cook Inlet started on a commercial basis in 1951. Both trawls and pots were used and effort was concentrated in Kachemak Bay. A total of 6,619 pounds of king crab was landed. In 1952 there was very little effort and the catch was only 2 900 pounds, occurring in the late summer. 1953 was the first year of any considerable production of king crab in Cook Inlet as effort was accelerated and 1.3 million pounds were taken. Pots, trawls and tangle nets were used and effort was concentrated in August and September. About 12 boats participated in the fishery. The fishery developed slowly between 1953 and 1959 and the average production during this period was 1.4 million pounds, nearly all caught in Kachemak Bay.

A jump in production occurred in 1960 when 60 boats registered for king crab. Although only 35 of these boats participated in the fishery at any one time, the catch jumped up to 4.3 million pounds. There were several exploratory fishing trips made in 1960 by Cook Inlet boats - mainly to Port Dick, Nuka Bay, and other parts of the Outer district.

Figure 2  
PROPOSED

COOK INLET

KING CRAB MANAGEMENT DISTRICTS

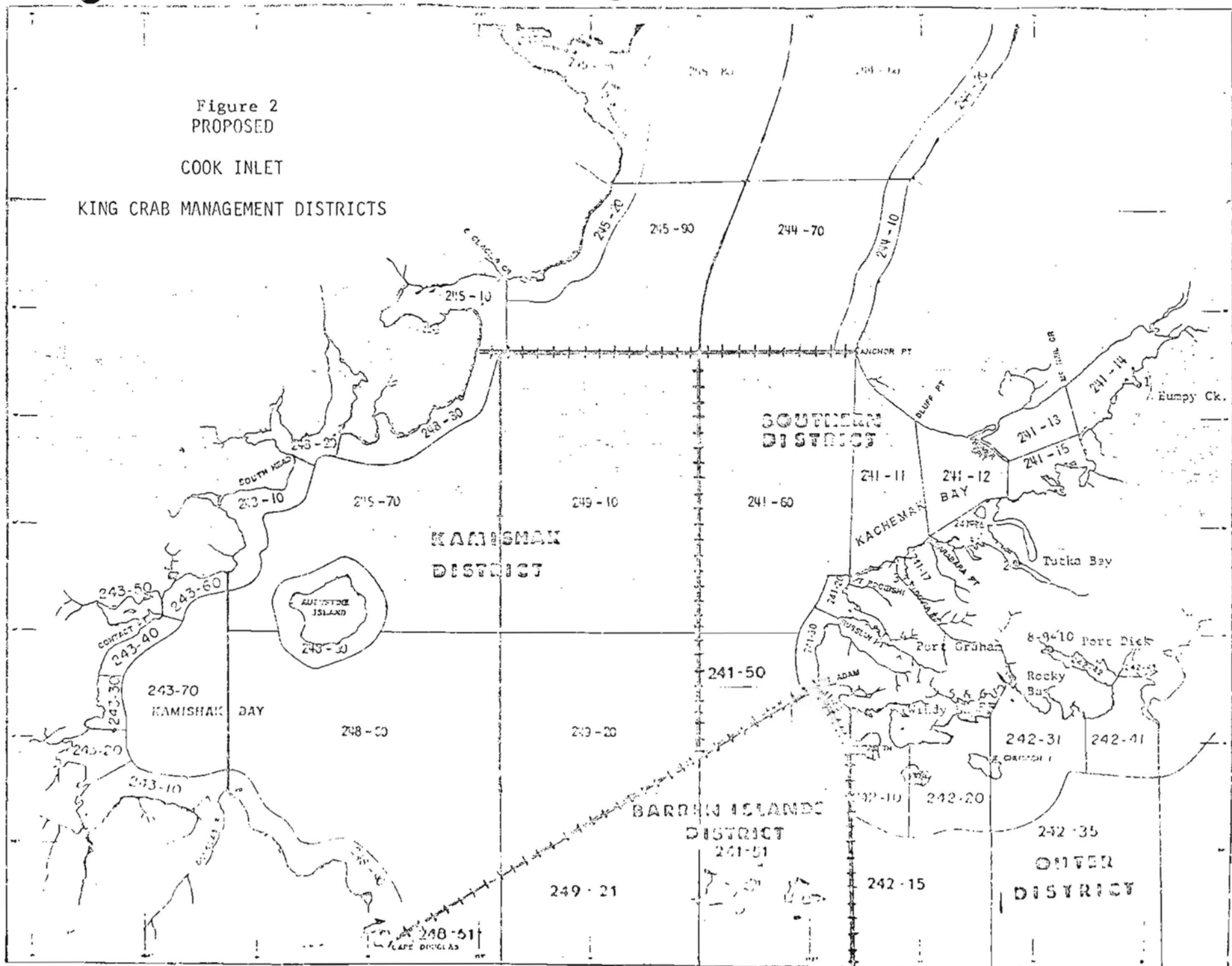


Table 1. Cook Inlet King Crab Catch By District, 1968-1971.

District	1971	1970	1969	1968	District	1968-1 Average
Southern	1,237,802	1,495,759	1,303,655	1,001,398	Southern	1,259,65
Kamishak	2,302,583	1,899,224	1,335,019	2,810,683	Kamishak	2,086,87
Barrens	599,720	447,134	97,818	154,975	Barrens	324,91
Outer	17,534	36,710	120,678	39,112	Outer	53,50
Eastern		3,975			Eastern	994
Total	4,157,639	3,882,802	2,857,170	4,006,168	Average Total	3,725,944

<u>District</u>	<u>Statistical Areas Encompassed</u>
Southern	241-11, 12, 13, 14, 15, 16, 17, 60, 50
Kamishak	248-10 thru 70 (except 61) - 249-10, 20; 243-10 thru 70.
Barrens	248-61, 249-21, 241-51.
Outer	241-40, all 242; all 232.
Eastern	231; 233

Kamishak Bay was fished commercially for the first time in 1961 and 1.2 million pounds were taken from this area by 10 boats. The total effort in Cook Inlet was 45 to 50 boats and the catch for all districts was 4.2 million pounds. In 1962 the Kamishak Bay area was fished year-round for the first time, and 62 per cent of the 6.8 million pound catch was taken in this district.

In 1963 the Cook Inlet area went from 6 1/2 inch carapace width to a 7 inch carapace width for minimum legal size of male king crabs. This year also saw the largest catch that has been made in Cook Inlet, when 8.4 million pounds of crab were landed. The bulk of these (63 per cent) were taken in the Kamishak district. About 50 boats were active in the fishery. The Kamishak district was again the largest producer in 1964, with 74 per cent of the total catch taken there. 46 boats were involved in the fishery and the catch for all districts was 6.8 million pounds.

In 1965 a major decrease in effort occurred when many boats were transferred to Kodiak and other crabbing areas to the westward. During the year 23 vessels fished in Cook Inlet, but these were mostly the small "day boats". The Kamishak district was fished very lightly and only about one-fifth the number of crab were taken in that area as were taken the previous year. The 1965 total catch dropped to 2.8 million pounds as a direct result of lack of effort in the Kamishak district.

The 1966 catch of 3.9 million pounds for Cook Inlet still reflected the lack of effort in the Kamishak district. Only 121 landings were made from this district in 1966 compared to landings of around 400 per year from 1962 to 1964. 32 vessels were active in the fishery

but only 10 were of a size capable of fishing the Kamishak district. In 1967 a combination of poor fishing in Kachemak Bay and a lack of effort in Kamishak (99 landings) resulted in a total catch of only 3.1 million pounds. Effort increased to 177 landings in the Kamishak district in 1968 and the catch jumped up to nearly 3.0 million pounds. Kachemak Bay experienced its poorest year of the 1960's and only 1.0 million pounds were landed - resulting in a total Cook Inlet catch of 4.0 million pounds.

1969 was the first year under the quota system in Cook Inlet. The Board of Fish and Game established a 2.0 million pound quota in the Southern district (Kachemak Bay) and a 2.5 million pound quota for the Kamishak district. The fishing season was also reduced tremendously; with the season established from August 1 to February 28. This was in contrast to a season which was open nearly year round in previous years, except for spring softshell closures. Fishing was good (high C.P.U.E.) in both Kachemak and Kamishak in 1969 but due to the restrictive season and poor weather only 2.8 million pounds were landed. In 1970 C.P.U.E. remained stable in Kamishak and increased slightly in the Southern district. Good fall weather conditions resulted in increased landings in both districts and the 1970 catch increased to 3.9 million pounds. The 1971 catch is discussed in detail in the following section.

The king crab catch by year (1951 to 1971), the number of boats engaged in the crab fishery, the estimated dollar value to the fishermen, and the appropriate first wholesale value of the product appear in Table 2 and the catch by district by year appears in Table 3.

Table 2. Cook Inlet king crab catch and value of product,  
1951-1971

Year	Pounds crab	Boats	Value to fishermen <sup>1/</sup>	1st wholesale value <sup>2</sup>
1951	6,619		\$ 7,000	Not available
1952	2,900		3,000	" "
1953	1,359,854	12	136,000	" "
1954	1,275,852	7	127,000	" "
1955	1,915,821	12	191,000	" "
1956	2,129,035	12	213,000	" "
1957	620,858	5	62,000	" "
1958	752,990	5	75,000	" "
1959	2,191,437	25	219,000	" "
1960	4,287,432	9.8¢ 60	422,000	" "
1961	4,256,396	9.8¢ 71	419,000	\$ 890,000
1962	6,851,621	10.0¢ 70	685,000	1,550,000
1963	8,381,163	10.0¢ 50	838,000	2,610,000
1964	6,772,392	10.0¢ 46	677,000	1,770,000
1965	2,776,547	10.0¢ 23	278,000	720,000
1966	3,900,163	10.2¢ 33	390,000	1,340,000
1967	10.8 3,124,509	10.3¢ 34	322,000	1,250,000
1968	4,008,933	24.9¢ 44	1,000,000	2,930,000
1969	2,857,170	24.5¢ 29	700,000	2,300,000
1970	3,882,802	25.8¢ 41	1,000,000	3,250,000
1971	4,157,639	30.0¢	1,247,292	<sup>3/</sup>
Average	3,113,459		429,109	1,801,000 <sup>4/</sup>

<sup>1/</sup> Values are estimates based on price per pound paid to fishermen, rounded to nearest thousand.

<sup>2</sup> Based on annual reports from fish processors, rounded to nearest 10 thousand.

<sup>3</sup> Not available.

<sup>4</sup> 1961-1970 only.

Table 3. Cook Inlet king crab catch in pounds, by district, 1951-1971.

Year	Kachemak	Kamishak	Outer	Eastern	Total
1951	6,619				6,619
1952	2,900				2,900
1953	1,359,854				1,359,854
1954	1,275,852				1,275,852
1955	1,915,821				1,915,821
1956	2,129,035				2,129,035
1957	620,858				620,858
1958	752,990				752,990
1959	2,191,437				2,191,437
1960	4,219,776		67,656		4,287,432
1961	2,988,880	1,205,679	61,837		4,256,396
1962	1,968,980	4,305,444	577,197		6,851,621
1963	2,667,279	5,538,349	175,535		8,381,163
1964	1,760,660	4,967,824	43,908		6,772,392
1965	1,813,135	963,412			2,776,547
1966	1,887,948	1,974,559	37,656		3,900,163
1967	1,286,789	1,821,269	16,033	418	3,124,509
1968	1,004,683	2,965,658	39,112		4,009,453
1969	1,299,527	1,422,052	130,928		2,852,507
1970	1,495,759	2,237,259	149,784		3,882,802
1971	1,237,802	2,538,947	380,890		4,157,639

#### 1971 Season

The 1971 king crab catch of 4.1 million pounds in Cook Inlet was the highest since 1964. This high catch was not entirely the result of a large increase in effort or of a large recruit class of king crab entering the fishery. The 1971 king crab catch was made up of a good distribution of all size and age groups and is partially the result of strict conservation measures imposed by the Board in 1969. Since the quota, shorter seasons and the Bluff Point breeding sanctuary were established in 1969, there has been an increase in the average size of crab in the commercial catch. It appears that the Cook Inlet king crab stocks are in a healthy condition - in fact the size distribution from the 1971 commercial catch is similar to the size distribution of the 1963 catch - a year when 5.4 million pounds were harvested.

Table 4 shows the comparative size of commercially caught king crab in Cook Inlet since 1963. There is not sufficient data to be representative for some of the years between 1963 and the present and these years are omitted from the table. The data has been assembled into three size groups - the first composed of entirely recruit size crab - or crab from 7.0 to 7.7 inches in carapace width. The second group represents crab which have survived at least one year in the commercial fishery as legal size crabs and are from 7.8 to 8.6 inches in width. The third group are large crab from 8.7 inches to 10.0 inches in carapace width. In the Kachemak Bay area there has been an increase in larger size crab in both the summer and winter fisheries. In Kamishak a fairly stable situation has existed since 1962 and the 1971 size distribution closely parallels that of 1963. Carapace length data taken from the commercial fishery since 1962 appears in the appendix of this report in 10 millimeter size groups.

Table 4

## COMPARATIVE MEASUREMENTS OF KING CRAB CARAPACE LENGTHS, WINTER AND SUMMER CRAB

WINTER FISHERY								
CARAPACE SIZE RANGE	KAMISHAK				KACHEMAK			
	1963	1964	1970	1971	1963	1966	1970	1971
140 TO 159 MM	14%	14%	20%	18%	21%	16%	33%	11%
160 TO 179 MM	62%	51%	54%	60%	52%	65%	56%	69%
180 TO 200 MM+	23%	34%	27%	22%	27%	19%	11%	20%

SUMMER FISHERY										
CARAPACE SIZE RANGE	KAMISHAK					KACHEMAK				
	1963	1968	1969	1970	1970	1963	1968	1969	1970	1971
140 TO 159 MM	46%	52%	44%	59%	34%	69%	58%	65%	65%	40%
160 TO 179 MM	43%	39%	44%	33%	56%	28%	38%	32%	34%	52%
180 TO 200 MM+	11%	10%	12%	8%	10%	3%	4%	4%	1%	8%

The present quota in the Kamishak Bay and Outer district area is 1.5 million pounds. Due to the combination of a good recruit fishery in August and September and an extremely good pot-recruit fishery in November, the quota was reached about 3 1/2 months early. The November fishery was located in the vicinity of the Barren Islands and was on very large crab. Only 18 percent of the catch was made up of recruits whereas the catch in the three previous months was composed of 49 percent recruits. The average weight of crab taken in November was 9.1 pounds compared to an average weight of 7.9 pounds during the three previous months. The average weights by month since 1966 appear in Table 5. The C.P.U.E. also increased substantially in November when the school of large crab were located. The catch per pot in the Outer district doubled from 16.4 per pot for September and October to 32.9 crab per pot for November. (Table 6). Fishing ground surveys were conducted during November and showed that over 80 percent of the catch in the vicinity of the Barren Islands was legal males with a small percent of females and sublegal males being captured. (Table 7).

The catch in the Kamishak district has always been closely related to effort. Figure 3 shows the correlation between catch and effort in this district since 1961. The solid line represents catch in millions of pounds and the dotted line represents landings in hundreds. The highest years of production were 1962, 1963, and 1964 when catches exceeding 4 million pounds were made. Effort dropped tremendously in 1965 when many of the former Cook Inlet boats fished in the Kodiak area. Since 1965 the catch has fluctuated and as the graph shows, this has been due directly to effort. The lowest catch occurred in 1965 when 70 landings were made while the highest catch was made in 1968 when 177 landings resulted in a 3 million pound harvest.

TABLE 5. Average weight <sup>1/</sup> of king crab, by month, by year Cook Inlet, 1966-1971.

	January	February	March	April	May	June	July	August	September	October	November	December
1966 Kachemak	9.1	9.3	9.0	8.8	8.7	8.7	8.0	7.9	7.7	7.5	7.9	8.1
1966 Kamishak				9.1	9.2	9.0	7.9	8.2	8.3	8.5	8.7	9.2
Ave. Cook Inlet <sup>2/</sup>	9.1	9.3	9.1	8.9	9.2	8.9	8.0	8.0	8.1	8.1	8.7	8.5
1967 Kachemak	8.8	9.4	9.1	8.8			6.9	7.6	7.5	7.4	8.0	7.5
1967 Kamishak			9.9	9.7			7.9	8.1	8.3	8.0	9.4	
Ave. Cook Inlet	8.8	9.4	9.2	9.6			7.5	7.9	8.2	7.9	8.9	7.5
1968 Kachemak	8.2	8.8	8.5	8.2				7.7	7.4	7.2	8.2	8.3
1968 Kamishak	9.3	9.8	10.1	9.9				7.6	8.7	9.2	8.9	9.3
Ave. Cook Inlet	8.9	9.3	9.8	9.9				7.6	8.4	9.1	8.7	8.7
1969 Kachemak	8.6	7.7						7.3	7.0	7.0		7.8
1969 Kamishak	8.9	11.0						7.8	7.7	8.4	8.0	9.1
Ave. Cook Inlet	8.7	8.8						7.5	7.4	7.9	8.0	8.5
1970 Kachemak	8.7	8.2						7.0	7.3	7.0	7.3	7.2
1970 Kamishak	8.8	8.9						7.6	8.1	8.1	8.1	8.6
Ave. Cook Inlet	8.9	8.5						7.2	7.9	8.1	8.1	8.2
1971 Kachemak	7.9	8.5	8.8					7.8	7.7	7.5	8.3	8.7
1971 Kamishak	8.5	8.7	9.4					8.0	7.9	7.9	9.1	---
Ave. Cook Inlet	8.2	8.5	8.9					8.0	7.9	8.1	9.2	8.7

<sup>1/</sup> Weight in pounds, rounded to nearest tenth. Weights computed from Alaska Department of Fish and Game fish ticket receipts.

<sup>2/</sup> Average weight for entire Cook Inlet area including Outer District.

Table 6. King crab average catch per pot, by month and district, 1968-1972 .

Year	Month	Kachemak	District Kamishak	Outer
1968-69	August	11.5	26.0	----
	September	6.7	19.7	----
	October	4.5	20.3	3.2
	November	2.6	24.7	----
	December	6.4	20.9	----
	January	2.4	20.0	27.9
	February	3.8	11.1	10.3
Seasonal Ave.		4.2	20.7	16.3
1969-70	August	15.3	41.9	26.2
	September	14.3	30.8	----
	October	8.8	15.0	----
	November	----	----	----
	December	7.1	16.3	----
	January	5.3	16.6	17.4
	February	5.8	22.7	----
Seasonal Ave.		11.3	27.6	19.6
1970-71	August	17.8	25.0	----
	September	5.6	35.3	45.4
	October	2.1	29.7	9.0
	November	10.8	29.5	21.0
	December	3.7	19.9	2.9
	January	7.3	15.5	1.5
	February	6.1	4.2	8.9
Seasonal Ave.		11.6	27.9	23.0
1971-72	August	9.6	26.7	----
	September	5.1	27.7	16.2
	October	4.1	15.1	16.7
	November	2.9	21.1	32.9
	December	9.0	----	----
	January	12.5	----	----
	February	6.6	----	----
	March	10.8	----	----
Seasonal Ave.		7.6	22.6	21.8

Table 7. Cook Inlet king crab catch composition surveys, 1971-72

Southern District								
Date	No. Pots Sampled	Legal Males	Percent	Sublegal Males	Percent	Females	Percent	Total Crab
7/13/71	15	262	7.60	1593	46.20	1593	46.20	3448
8/7/71	11	113	43.97	132	51.36	12	4.67	257
8/9/71	11	92	26.82	227	66.18	24	7.00	343
9/10/72	15	119	49.4	5	2.1	115	48.1	239
10/11/72	27	111	8.0	7	.5	1276	91.5	1394
10/16/72	30	81	33.6	-	-	160	66.4	241
10/24/72	31	93	7.7	35	2.9	1072	89.3	1200
10/24/72	34	83	32.1	-	-	176	67.9	259
1/2/72	27	113	25.1	2	.4	336	74.5	451
3/2/72	21	115	12.0	9	.9	836	87.1	960
3/9/72	53	967	49.5	186	9.5	802	41.0	1955
Kamishak District								
Date	No. Pots Sampled	Legal Males	Percent	Sublegal Males	Percent	Females	Percent	Total Crab
8/14/71	65	3840	(51.72)	1800	(24.24)	1784	(24.03)	7424
8/19/71 to 8/24/71	68	1750	(41.29)	1640	(38.67)	849	(20.03)	4240
9/30/71	75	1111	(29.88)	1024	(27.54)	1582	(42.56)	3717
9/27/71 to 10/3/71	149	1706	(39.11)	2054	(47.09)	601	(13.78)	4361
11/13/71 to 11/17/71	191	8910	(80.50)	1548	(13.99)	610	(5.51)	11068

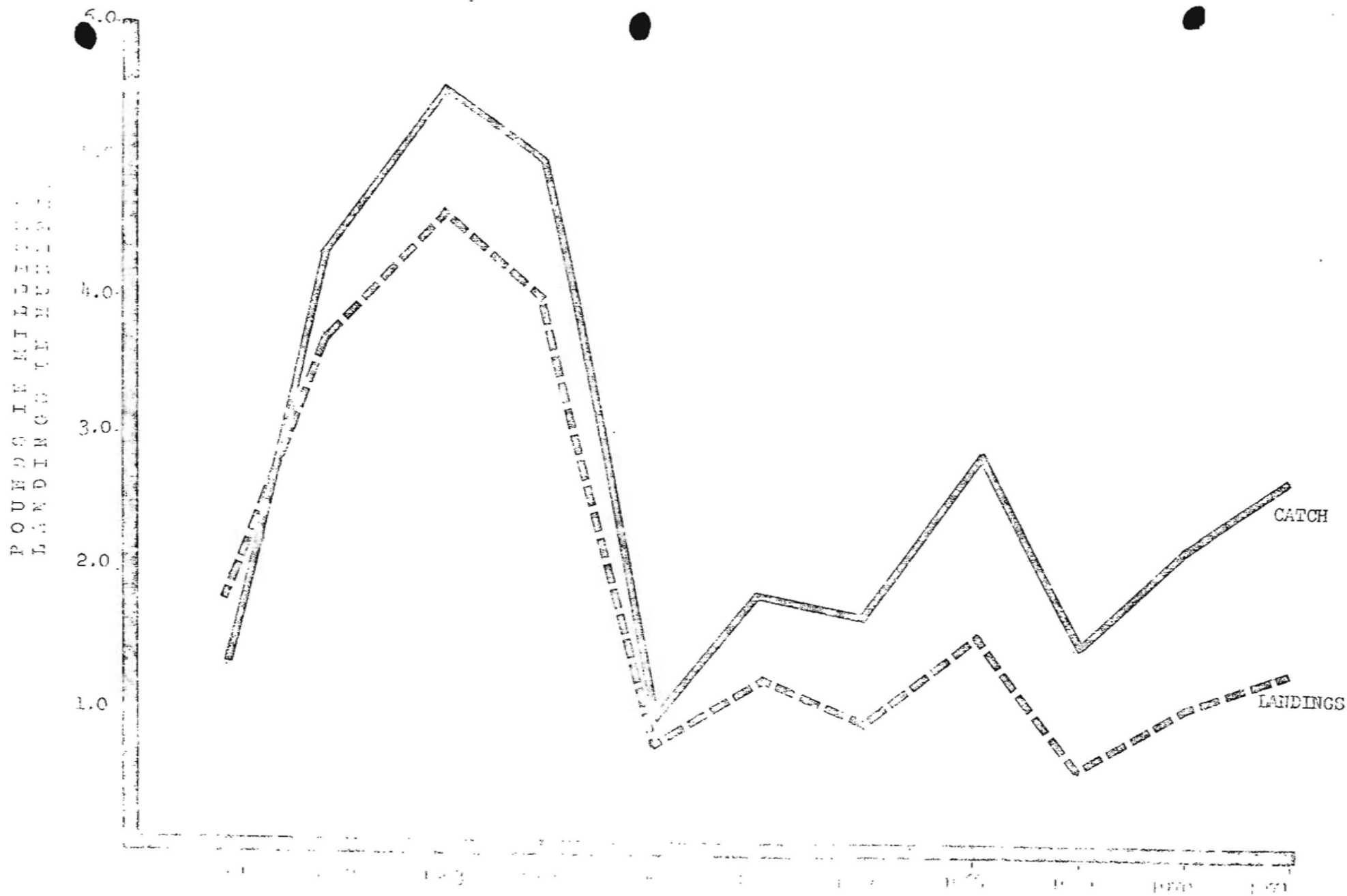


Figure 3.

Crab fishing started out slow in the Southern district during 1971. Poor weather during the winter months and an apparent early movement of crab out of Kachemak Bay during August were the two prime reasons for the low calendar year harvest of 1.2 million pounds. The catch during the quota period, August 1971 to March 15, 1972, presented a different picture with 1.9 million pounds being taken, the highest since quotas were established.

The crabs that were harvested from Kachemak Bay this past winter were the largest since 1963. Twenty per cent of the catch since January was composed of crabs 180 millimeter or over in carapace length or 8.6 inches in carapace width. There is increasing evidence from carapace length frequency data, that the winter fishery in Kachemak Bay is primarily on transient crab that are located in the Barren Islands and north end Kodiak fisheries during the late summer and fall months. A comparison of carapace length data from these three fisheries appears in Figure 4. There is also a good relationship in average weights between the Kamishak and Southern district fisheries and this is depicted, by year since 1961, in Figure 5.

The C.P.U.E. was also higher during the winter months in Kachemak Bay than we have observed in past years. The effort in number of boats was about normal, however, the average size boat was somewhat greater due to the closure of the Kamishak and Outer districts in November and the subsequent movement of six larger boats (50' to 90' type) into Kachemak Bay.

During February several trips were made to the king crab grounds in Kachemak Bay with fisherman to assess catch composition and shell condition. The gear was found to be concentrated in two major areas in the bay and catch composition and shell condition varied tremendously between these two areas. In the inner bay, the catch was comprised of about 90 per

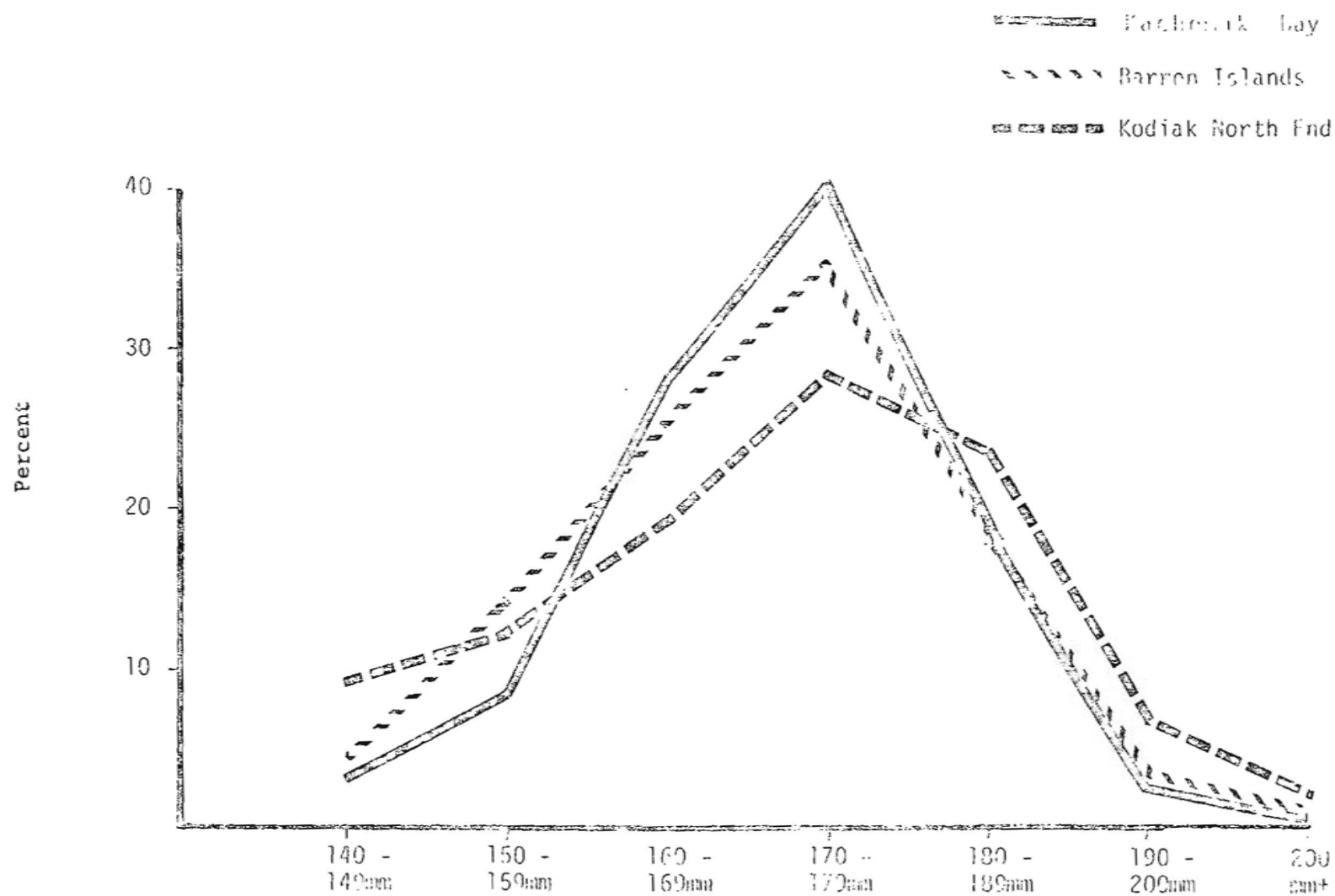


Figure 4 . Comparison of king crab carapace length frequencies from Kachemak Bay, Barren Islands, and Kodiak North End, 1971-1972.

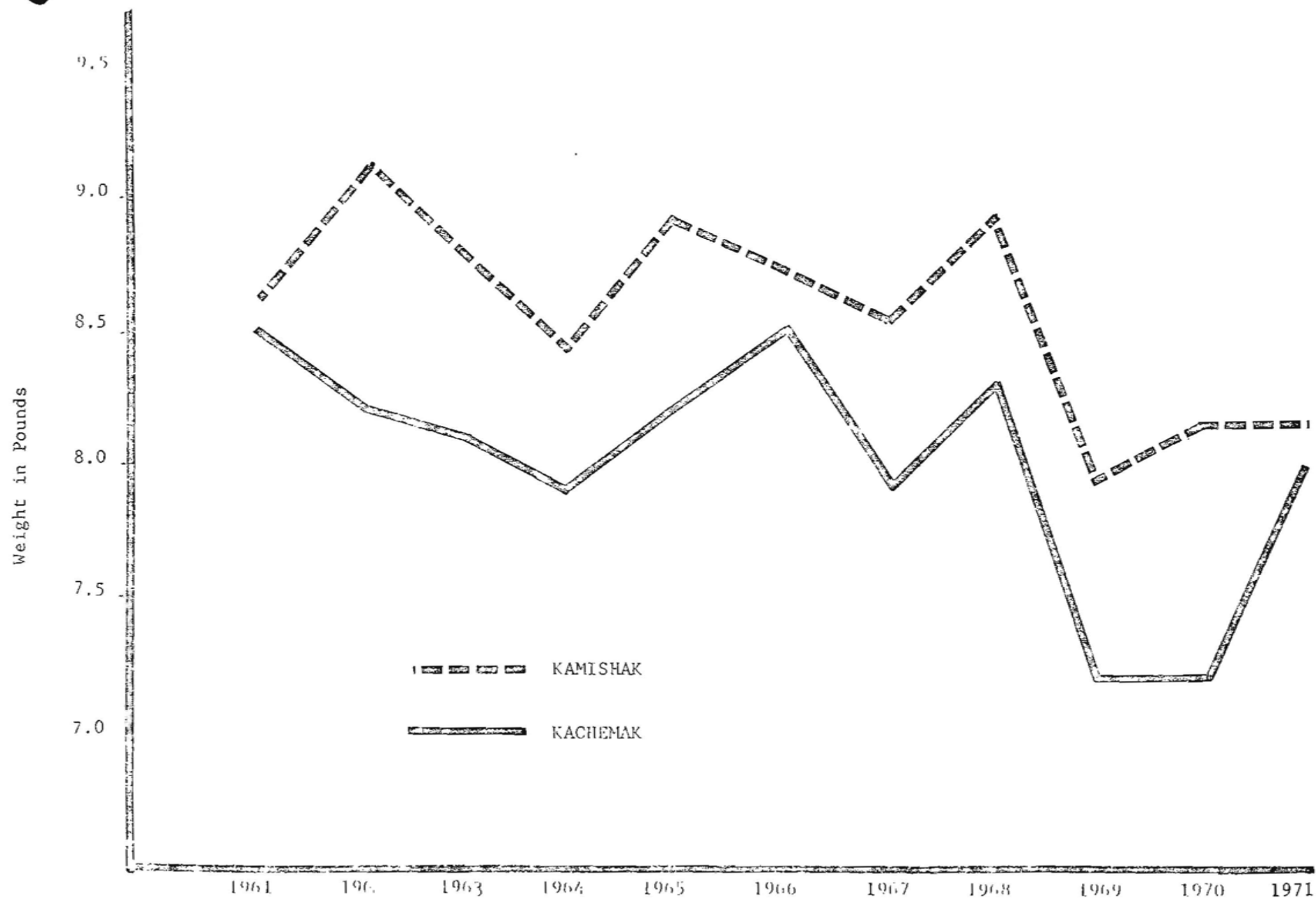


Figure 5. Average weight king crab, Kamishak and Southern Districts, Cook Inlet, 1961-1970.

cent females and only 8 percent legal males, while in the Outer Bay the catch was about 60 percent females and 40 percent legal males. There were virtually no softshell crab showing up in the outer part of the bay while one trip to the inner bay showed almost 10 percent of the females being handled were in a soft condition. Due to this biological data plus the fact that large crab were being taken and we were still about 400 thousand pounds short of the quota, the season was extended 15 days for the outer part of Kachemak Bay, or that area west of a line from Bluff Point to Barbara Point. The inner area closed on February 20. The 15 day extension resulted in a catch of approximately 310,000 pounds. The catch composition surveys conducted during the 1971-72 quota season appear in Table 7 .

## SHRIMP

### CATCH

The total Cook Inlet shrimp catch in 1971 was 5.4 million pounds, slightly less than the 1970 catch. (Table 8). Fishing started out slow in January due to poor weather conditions and only 102,836 pounds were harvested. During late February, March, and early April shrimp were concentrated in the deep hole off Yukon Island and the catch and catch per unit was high during this period. During May shrimp appeared to be widely dispersed and with greenhead condition, common throughout the month. The catch was only 160,617 pounds. Catches varied between 400 to 600 thousands pounds from June to November and they dropped drastically in December to 160,000 pounds due partly to poor weather conditions. The 1971 shrimp catches by month appear in Table 9.

A total of 567 landings were made in 1971 compared to 523 landings in 1970. The shrimp fleet still consists of three vessels; two in the 45' to 50' class and one in the 75' to 80' class. With the five million pound quota in effect it is unlikely that the local Homer plant (Alaska Seafoods Inc.) will add any more vessels to the fleet. Seward Fisheries, located in Seward, is currently installing four shrimp peelers and may possibly have one or two boats fishing in Kachemak Bay during 1972.

Cook Inlet shrimp catches by month since 1966 appear in Table 10.

Table 8 Shrimp landings in pounds, Cook Inlet, 1960-1971.

Year	Trawl	Pot	Total
1960			711,355
1961			1,045,170
1962			532,291
1963	1,897,580		1,897,580
1964	599,665	1,746	601,411
1965	82,280		82,280
1966	285,976	23,383	309,359
1967	741,438		741,438
1968	25,681	1,067	26,748
1969	1,847,071	131	1,847,202
1970	5,808,160	9,473	5,817,633
1971	5,395,116	53,462	5,448,578

Table 9 Shrimp trawl catches and landings by month, 1971.<sup>1/</sup>

Month	Pounds	Cumulative Pounds	Landings
January	102,836	102,836	17
February	446,136	548,972	45
March	979,136	1,528,108	68
April	466,265	1,994,373	49
May	160,617	2,154,990	26
June	434,045	2,589,035	69
July	484,362	3,073,397	65
August	590,623	3,664,020	54
September	624,752	4,288,772	58
October	488,492	4,777,264	47
November	457,822	5,235,086	45
December	160,030	5,395,116	24
Totals	5,395,116	5,395,116	567

Table 10

TOTAL  
COOK INLET SHRIMP CATCH - 1966-1971

Year	January	February	March	April	May	June	July	August	September	October	November	December	Total
1966	17,830	9,611	4,427	72	204	70				38,003	117,872	121,270	309,359
1967	118,890	200,193	53,555	107,160		33,885	217,535		10,220				741,438
1968					11,335	1,728			216	11,022	2,159	288	26,748
1969	1,130	3,274	1,870	11,927	4,661	104,026	158,178	249,924	345,296	432,848	219,791	314,277	1,847,202
1970	215,156	449,716	495,918	551,092	339,139	666,116	853,838	767,715	603,501	326,831	386,843	161,768	5,817,633
1971	102,836	446,136	979,136	466,265	165,257	436,917	484,622	595,847	625,721	501,968	484,542	162,248	5,451,495

## TANNER CRAB

The 1971 tanner crab catch in Cook Inlet was the highest on record since the fishery developed in 1968. The catch totaled 2.1 million pounds in 1971, compared to 1.3 million in 1970, 1.5 million in 1969, and 165 thousand pounds in 1968. The high catch in 1971 was largely the result of increased effort as 40 boats participated in the fishery compared to 25 boats in 1970. 1971 landings totaled 613 compared to 314 in 1970. The catch, number of landings, number of vessels engaged in the fishery, and average weights by year since 1968 appear in Table 11.

The average weight of tanner crab in the commercial catch during 1971 was 2.4 pounds and is a drop of one half pound from the 1970 average weight of 2.9. The main reason for the reduction in average weight was the fact that a large proportion of the catch was taken from the Kamishak Bay area in the late spring on smaller crab which were in poor condition. The catch by area, by month for 1971 appears in Table 12.

Fishing is allowed for tanners in Cook Inlet twelve months of the year and the only regulation in effect at the present time is the four inch maximum tunnel width which was designed to keep legal size king crab from entering the tanner pots.

In addition to monitoring the commercial catch, carapace length frequencies (Figure 6 ) have been taken and catch composition surveys to the fishing grounds have been made.

TABLE 11      Tanner Crab Landing, by Area, Cook Inlet, 1971

Month	Southern	Kamishak	Outer	Eastern	Total
January	26,545	1,758	1,258		29,561
February	107,832	2,468	2,816		113,116
March	227,506	690			228,196
April	358,024	7,876			365,900
May	231,751	175,222			406,973
June	82,357	349,115			431,472
July	3,024	268,925			271,949
August					
September	728				728
October	602	328			930
November	56,992		21,712		78,704
December	87,450		101,870		189,320
	1,182,811	806,382	127,656		2,116,849

Table 12 Tanner crab landings, by month, in pounds, Cook Inlet, 1968-1971.

Month	1968	1969	1970	1971
January		39,251	61,394	29,561
February	6,284	144,556	155,370	113,116
March	8,613	295,993	262,990	228,196
April	45,200	474,234	413,991	365,900
May	80,420	161,978	363,035	406,973
June	5,420	288,752	21,824	431,472
July		41,950		271,949
August	340			
September	490			728
October	1,570	10,308	1,304	930
November	1,514		835	78,704
December	15,296	11,783	15,797	189,320
Year Totals	165,147	1,468,805	1,333,889	2,116,849
No. Landings	152	538	314	313
No. Vessels	25	24	25	40
Average Wt.	3.1	3.1	2.9	2.4

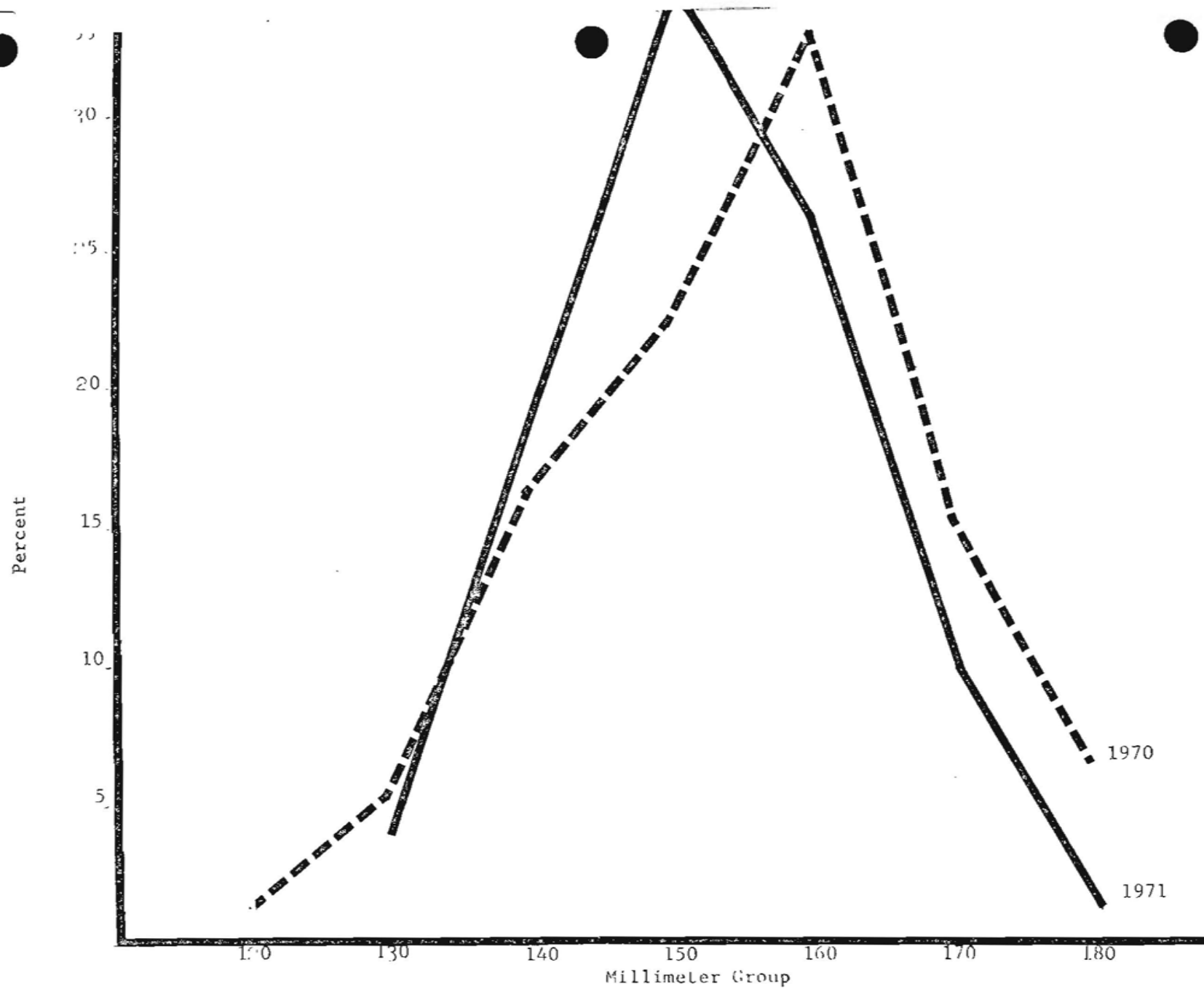


Figure 6 Tanner crab width frequencies by percent, Cook Inlet, 1970-1971

### DUNGENESS CRAB

The total 1971 dungeness crab harvest in Cook Inlet was 96,846 pounds, less than half the 1970 take of 208,577 pounds. The bulk of the catch was made between June and November when 125 of the total 136 yearly landings were made. The 1971 landings and catches by month appear in Table 13.

The Cook Inlet dungeness crab catch from 1961 to 1971 appears in Table 14 and the catches by month since 1966 appear in Table 15.

Table 13 Dungeness crab catch and landings, by month, Cook Inlet, 1971.

Month	Kachemak Bay Pounds	Landings	Boats
May	1,745	2	1
June	11,271	19	4
July	21,818	29	5
August	17,049	18	7
September	20,287	19	5
October	15,951	22	4
November	7,221	18	6
December	1,504	9	3
Total	96,846	136	

Table 14 Cook Inlet dungeness crab catch, 1961-1971.

Year	Crab	Pounds	
1961		191,588	
1962	204,573	460,725	
1963		1,677,204	Ave
1964	177,708	421,452	St.
1965	32,378	82,280	5.5
1966	45,625	127,977	6.7
1967	2,141	7,168	5.4
1968		481,764	
1969		48,501	5.1
1970	84,686	208,577	7.9
1971	35,387	96,846	7.9
			5.1
			Ave.
			St.
			6.2
			5.5
			5.8
			6.0
			6.9
			6.1
			6.2
			6.7

Table 15

COOK INLET DUNCENESS CRAB CATCH - 1966-1971

Year	January	February	March	April	May	June	July	August	September	October	November	December	Total
1966	-0-	-0-	-0-	-0-	3,607	6,150	-0-	48,345	69,875	-0-	-0-	-0-	127,977
1967	-0-	-0-	-0-	-0-	1,776	1,471	-0-	-0-	90	3,831	-0-	-0-	7,168
1968	-0-	-0-	-0-	-0-	137	-0-	84,480	181,459	118,365	66,841	30,482	-0-	481,764
1969	-0-	-0-	335	786	1,608	3,987	13,898	14,876	13,011	-0-	-0-	-0-	48,501
1970	-0-	-0-	115	-0-	-0-	7,889	15,009	36,371	95,555	52,265	1,373	-0-	208,577
1971	-0-	-0-	-0-	-0-	1,745	11,271	21,818	17,049	20,287	15,951	7,221	1,504	96,846

## Appendix

Table I. King crab catch, deliveries, and average weight, by district - Cook Inlet - 1971.

SOUTHERN DISTRICT					KAMISHAK DISTRICT			
No.	Crab	Pounds	No. Del.	Ave. Wt.	Crab	Pounds	No. Del.	Ave. Wt.
Jan.	13,644	107,782	54	7.9	4,803	41,000	-	8.5
Feb.	15,150	128,484	131	8.5	1,480	12,907	5	8.7
Mar.	8,988	79,039	21	8.8	1,052	9,881	3	9.4
Apr.								
May								
June								
July								
Aug.	70,418	552,377	280	7.8	124,370	1,007,566	42	8.1
Sept.	20,592	159,142	172	7.7	115,156	916,416	41	7.9
Oct.	5,327	39,836	52	7.5	29,315	231,459	17	7.9
Nov.	2,610	21,763	23	8.3	35,041	312,702	8	8.1
Dec.	17,127	149,379	73	8.7				

OUTER DISTRICT					TOTAL			
No.	Crab	Pounds	No. Del.	Ave. Wt.	Crab	Pounds	No. Del.	Ave. Wt.
Jan.	992	9,943	3	10.0	19,439	158,725	61	8.2
Feb.	1,024	9,501	2	9.3	17,654	150,812	138	8.5
Mar.					10,040	86,932	24	8.8
Apr.								
May								
June								
July								
Aug.	3,001	23,710	1	7.9	197,789	1,583,653	323	8.0
Sept.	145	1,622	1	11.2	135,893	1,077,183	21	7.9
Oct.	11,105	98,023	6	8.8	45,747	369,318	75	8.1
Nov.	25,484	238,091	8	9.3	63,135	579,556	40	8.2
Dec.					17,127	149,379	73	8.7

## Appendix

Table II. 1971-72 King crab catch by week, Southern, Kamishak/Outer District

WEEK	(STAT WEEK	SOUTHERN POUNDS	MONTH TOTAL	KAMISHAK/OUTER POUNDS	MONTH TOTAL
32	( 8 1 - 8/ 7)	147,395		81,890	
33	( 8 8 - 8/14)	166,922		204,997	
34	( 8 15 - 8/21)	82,630		342,810	
35	( 8 22 - 8/28)	118,879		294,640	
36	( 8/29 - 8/31)	36,551	552,377	106,939	1,031,276
36	( 9 1 - 9/ 4)	35,443		278,314	
37	( 9 5 - 9/11)	36,141		95,482	
38	( 9 12 - 9/18)	43,988		301,927	
39	( 9 19 - 9/25)	22,010		181,119	
40	( 9 26 - 9/30)	21,561	159,143	61,201	818,041
40	(10 1 - 10/ 2)	6,956		24,171	
41	(10 3 - 10/ 9)	15,058		112,689	
42	(10 10 - 10/16)	4,535		61,421	
43	(10 17 - 10/23)	11,465		40,850	
44	(10 24 - 10/30)	1,822		70,632	
45	(10 31 - )	60	39,896	19,718	109,462
45	(11 1 - 11/ 6)	2,352		15,300	
46	(11 7 - 11/13)	695		326,226	
47	(11 14 - 11/20)	1,568		191,339	
48	(11 21 - 11/27)	15,450		24,928	
49	(11 28 - 11/30)	1,638	21,703		557,793
49	(12 1 - 12/ 4)	4,459			
50	(12 5 - 12/11)	12,145			
51	(12 12 - 12/18)	17,307			
52	(12 19 - 12/25)	43,411			
53	(12 26 - 12/31)	72,027	149,349		
1	( 1 1 - )	-0-			
2	( 1 2 - 1/ 8)	132,851			
3	( 1 9 - 1/15)	63,293			
4	( 1 16 - 1/22)	71,071			
5	( 1 23 - 1/29)	60,354			
6	( 1 30 - 1/31)	31,600	359,169		
6	( 2 1 - 2/ 5)	65,486			
7	( 2 6 - 2/12)	77,512			
8	( 2 13 - 2/19)	38,275			
9	( 2 20 - 2/26)	112,219			
10	( 2 27 - 2/29)	49,350	342,842		
10	( 3 1 - 3/ 4)	65,757			
11	( 3 5 - 3/11)	106,152			
12	( 3 12 - 3/18)	136,089	307,998		

Total harvest Kamishak/Outer 2,836,592

Total harvest Southern 1,832,477

4,669,069

Appendix  
Table III. King crab carapace length frequencies, Southern District  
Cook Inlet, 1971-72 quota period.

Month	140- 149 mm	Per- cent	150- 159 mm	Per- cent	160- 169 mm	Per- cent	170- 179 mm	Per- cent	180- 189 mm	Per- cent	190- 199 mm	Per- cent	200	Per- cent	Sample Size
Aug.	42	9.4	138	30.9	147	32.9	84	18.8	34	7.6	2	.4			447
Sept.	21	21.0	40	39.6	26	25.7	11	10.9	3	3.0					101
Nov.	2	20.0	4	40.0	1	10.0	3	30.0							10
Jan.	8	2.0	34	8.5	120	30.0	153	38.2	75	18.8	9	2.2	1	.2	400
Feb.	15	2.4	61	10.0	180	29.5	240	39.3	103	16.9	10	1.6	1	.2	610
Mar.	47	3.2	222	15.1	418	28.4	505	34.3	250	17.0	31	2.1			1473
Total	135	(4.44)	449	(16.41)	892	(29.33)	996	(32.75)	465	(15.29)	52	(1.71)	2	(.07)	3041

King crab carapace length frequencies, Kamishak/Outer District  
Cook Inlet, 1971-72 quota period.

Month	140- 149 mm	Per- cent	150- 159 mm	Per- cent	160- 169 mm	Per- cent	170- 179 mm	Per- cent	180- 189 mm	Per- cent	190- 199 mm	Per- cent	200	Per- cent	Sample Size
Aug.	40	9.7	96	23.3	128	31.1	100	24.3	40	9.71	7	1.7	1	.2	412
Sept.	179	25.9	252	36.4	157	22.7	81	11.7	22	3.2	1	.1			692
Oct.	51	18.1	94	33.3	69	24.5	42	14.9	21	7.4	3	1.1	2	.7	282
Nov.	46	6.3	116	15.9	191	26.2	231	31.7	122	16.7	17	2.3	5	.7	728
Total	316	(14.9)	558	(26.4)	545	(25.8)	454	(21.5)	205	(9.7)	28	(1.3)	8	(.4)	2114

# Appendix

Table IV. Cook Inlet king crab catch in pounds, by month, 1963-1971.

Month	1963	1964	1965	1966	1967	1968	1969	1970	1971
January	156,697	165,752	123,228	60,189	20,456	38,095	80,678	168,305	158,725
February	847,221	336,459	52,019	318,031	149,861	368,975	162,827	446,582	150,892
March	449,132	526,354	626,006	255,749	324,234	937,176			88,933
April	587,187	733,497	372,276	580,428	580,984	363,742			
May	628,420	411,023	220,572	502,257		563			
June	1,791,634	776,858	252,311	632,303					
July	1,808,687	2,083,318	507,765	652,339	893,904				
August	1,078,313	1,164,270	523,125	530,513	816,891	1,153,828	1,174,096	1,586,635	1,583,652
September	638,258	345,781	72,179	226,607	247,872	638,954	1,042,398	755,980	1,077,183
October	243,065	148,703	1,018	14,746	69,179	332,890	292,853	478,644	369,318
November	34,912	47,827	9,137	55,978	11,788	109,891	8,045	328,209	579,556
December	117,637	32,550	16,911	71,023	9,390	65,339	92,145	118,447	149,379
Totals	8,381,163	6,772,392	2,776,547	3,900,163	3,124,509	4,009,453	2,852,507	3,882,802	4,157,639

Appendix  
Table V. Kamishak District king crab catch  
in pounds, by month. 1963-1971.

	1963	1964	1965	1966	1967	1968	1969	1970	1971	Average
January		52,917	28,900			23,370	9,852	96,694	41,000	42,122
February	364,487	110,075				119,066	42,917	203,951	12,907	142,234
March	308,472	326,982	114,100		36,348	815,711			9,894 <sup>1/</sup>	320,330
April	535,963	667,845	254,030	306,142	500,730	351,487				436,033
May	349,320	319,887	108,649	496,378						318,558
June	1,225,121	595,784	155,844	524,397						625,286
July	1,329,081	1,591,659	178,090	225,740	498,786					764,671
August	822,144	898,557	111,963	215,734	500,888	676,588	526,857	570,074	1,007,566	592,263
September	260,264	290,464	60,343	78,983	29,174	97,507	459,065	153,825	916,419	260,671
October	201,139	67,433		1,117	7,205	35,079	23,814	56,149	231,459	55,991
November	29,102	12,763		42,144	8,183	88,983	8,045	285,389	319,702	67,801
December	81,793	33,458	16,911	48,049	9,390	38,435	39,663	27,873	-0-	36,946

<sup>1/</sup> Not included in average as only 6 days of month were fished.

<sup>2/</sup> Preliminary figure.

Appendix  
Table VI. Southern District king crab catch  
in pounds, by month. 1963-1971.

	1963	1964	1965	1966	1967	1968	1969	1970	1971	Average
January	75,686	100,686	94,328	60,189	20,456	14,725	16,566	36,697	107,782	58,568
February	442,354	219,818	52,019	311,269	141,298	221,916	91,042	233,361	128,484	204,618
March	140,660	199,372	511,906	253,068	282,286	119,918			79,039 <sup>1/</sup>	251,202
April	51,224	65,652	118,246	269,238	77,966	5,270				97,933
May	265,274	91,136	111,923	5,879						118,553
June	566,513	181,074	96,467	107,906						237,990
July	479,606	491,659	329,675	426,599	395,108					424,529
August	256,169	264,750	411,162	314,779	316,003	477,240	603,567	1,016,561	552,377	468,068
September	260,264	88,045	60,343	78,983	29,174	97,507	459,065	153,825	159,143	154,039
October	41,926	24,632	1,018	5,225	11,503	8,764	93,752	12,876	39,836	24,962
November	5,810	18,336	9,137	6,764	3,605	20,388		14,566	21,763	11,229
December	81,793	15,820	16,911	48,049	9,390	38,435	39,663	27,873	149,373	34,742

2,461,249

<sup>1/</sup> Not Included in average as only 6 days of month were fished.

<sup>2/</sup> Preliminary figures.

Appendix

Table VII. Cook Inlet king crab catch per landing, 1960--1971

Year	Landings	Crab	Crab Per Landing	Total Pounds
<u>Southern District</u>				
1960	2434	455,000	187	4,219,776
1961	2619	364,045	139	3,108,352
1962	1843	296,123	160	2,546,177
1963	1435	347,096	241	2,042,814
1964	1019	229,165	225	1,804,568
1965	742	217,544	293	1,767,420
1966	681	226,557	332	1,325,604
1967	705	164,335	233	1,303,240
1968	659	128,720	195	1,043,275
1969	681	196,350	288	1,434,583
1970	716	224,373	313	1,645,543
1971	827	153,856	186	1,237,796
<u>Kamishak District</u>				
1960	None			
1961	181	140,566	776	1,215,766
1962	372	473,601	1273	4,305,444
1963	445	635,225	1427	5,538,349
1964	401	589,796	1470	4,967,824
1965	79	108,019	1367	963,412
1966	121	225,537	1863	1,974,559
1967	99	213,285	2154	1,821,269
1968	177	331,439	1873	2,965,658
1969	66	178,825	2625	1,402,537
1970	106	276,807	2611	2,237,250
1971	119	311,217	2615	2,538,947

Appendix  
Table VIII. Cook Inlet king crab average weights, 1960-1971.

Year	Kamishak District average weight	Southern District average weight
1960	No fishery	9.2
1961	8.6	8.5
1962	9.1	8.2
1963	8.7	8.1
1964	8.4	7.9
1965	8.9	8.2
1966	8.7	8.5
1967	8.5	7.9
1968	8.9	8.3
1969	7.9	7.2
1970	8.1	7.2
1971	8.1	8.0
Total average	8.6	8.1

# Appendix

Table IX. King crab carapace length frequencies, 1962--1971

## Southern District

Date	130 to 139mm %	140 to 149mm %	150 to 159mm %	160 to 169mm %	170 to 179mm %	180 to 189mm %	190 to 199mm %	200mm Plus %	Sample Size
2/62		6 2.2	6 2.2	57 20.8	105 38.3	71 25.9	25 9.1	4 1.5	274
7/62	12 .8	392 26.6	503 34.1	280 19.0	171 11.6	90 6.1	25 1.7	2 .1	1475
2/63		25 3.0	122 14.9	171 20.9	255 31.1	193 23.5	50 6.1	4 .5	820
3/63		17 10.4	36 21.9	33 20.1	43 26.2	28 17.1	6 3.7	1 .3	164
7/63		139 21.0	279 42.0	145 23.0	68 11.0	11 2.0	3 1.0		645
8/63		54 26.0	70 43.0	40 19.0	18 9.0	4 2.0	1 1.0		209
1/66	4 .6	16 2.5	77 11.8	153 23.5	248 38.1	136 20.9	14 2.1	2 .3	650
2/66		10 2.5	54 13.5	113 28.3	147 36.8	64 16.0	9 2.2	2 .5	399
3/66		5 5.0	12 12.0	21 21.0	37 37.0	19 19.0	6 6.0		100
4/66	7 3.5	6 3.0	25 12.5	66 33.0	66 33.0	25 12.5	4 2.0	1 .5	200
6/66		17 8.5	65 32.5	62 31.0	39 19.5	14 7.0	3 1.5		200
3/68	6 1.0	128 21.8	204 34.8	163 27.8	61 10.4	20 3.4	4 .7		536
3/69	5 .5	202 19.1	476 45.0	261 24.7	75 7.1	26 2.5	11 1.0	1 .1	1057
2/70		21 6.2	90 26.5	103 31.9	84 24.8	28 8.3	8 2.4		339
3/70		6 10.7	13 23.2	18 32.1	13 23.2	4 7.1	2 3.6		56
8/70	2 .2	134 18.31	465 46.3	248 24.7	91 9.0	15 1.5			1005
10/70		52 17.8	101 34.6	30 27.4	47 16.1	8 2.7	4 1.4		292
11/70	5 .1	79 15.8	165 33.0	147 29.0	88 17.6	14 2.8			500
12/70	6 1.2	136 27.0	159 31.6	123 24.4	67 12.3	9 1.8	3 .6		500
1/71		31 6.1	112 22.2	132 26.1	131 25.9	42 8.3	6 1.2		504
2/71		33 2.5	231 17.7	475 36.3	414 31.6	135 10.3	20 1.5		1308
3/71		5 2.5	35 17.5	69 34.5	69 34.5	20 10.0	2 1.0		200



Appendix

Table X. King crab carapace length frequencies, 1962--1971

Hamishak District

Date	130 to 139mm %	140 to 149mm %	150 to 159mm %	160 to 169mm %	170 to 179mm %	180 to 189mm %	190 to 199mm %	200mm Plus %	Sample Size
6/62		52 1.1	322 7.0	1270 27.6	1762 38.3	911 19.8	249 5.4	37 .8	4603
7/62		145 3.0	551 13.0	955 22.0	1299 31.0	941 22.0	327 8.0	46 1.0	4264
3/63		9 2.6	41 11.8	98 28.2	119 34.2	69 19.8	9 2.6	3 .8	348
6/63		365 15.0	731 31.0	530 22.0	452 19.0	218 9.0	60 3.0	11 4.0	2367
7/63		1078 11.0	3000 30.0	2643 27.0	1923 19.0	964 10.0	290 3.0	37 4.0	9935
8/63		336 14.0	760 32.0	614 26.0	402 17.0	230 10.0	35 1.0	2 .2	2379
2/64		3 1.0	39 13.4	62 21.2	88 30.1	75 25.7	22 7.5	3 1.0	292
5/66		4 2.0	20 10.0	31 15.5	74 37.0	56 28.0	14 7.0	1 .5	200
8/68	2 .3	139 21.8	189 29.6	162 25.4	85 13.3	37 5.8	24 3.8		638
8/69	6 .2	237 8.9	924 34.6	930 31.1	251 13.2	253 9.5	53 2.0	14 .5	2668
2/70		12 2.5	83 17.2	128 26.5	131 27.1	92 19.0	32 6.6	5 1.0	483
3/70	2 .2	194 17.4	463 41.5	236 21.1	137 12.3	77 6.9	6 .5	1 .1	1116
10/70		100 11.3	269 30.4	264 29.9	183 20.7	58 6.6	10 1.1		894
11/70		150 12.1	329 26.5	383 31.3	274 22.1	87 7.0	11 .9	2 .2	1241
2/70		61 4.8	249 19.6	426 32.7	342 26.9	156 12.1	43 3.4	5 .4	1272
1/71		8 1.6	78 15.6	187 37.4	125 25.0	74 14.8	27 5.4	1 .2	500
2/71		22 3.8	95 16.2	179 30.6	177 30.3	88 15.0	22 3.8	2 .2	585
3/71		3 1.5	27 13.1	69 33.5	75 36.4	29 14.1	3 1.5		206